
FINAL

**SITE INSPECTION ADDENDUM REPORT
JOLIET ARMY AMMUNITION PLANT, ILLINOIS**

SEPTEMBER 2009

Prepared for:

UNITED STATES ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
P.O. Box 1715
Baltimore, Maryland 21203

Prepared by:

MALCOLM PIRNIE, INC.
701 Town Center Drive
Suite 600
Newport News, Virginia 23606

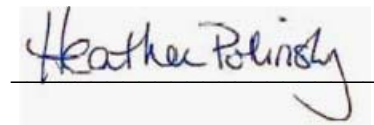
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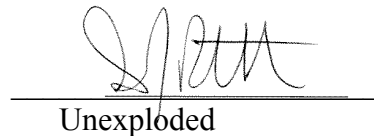


Heather Polinsky, Vice President
Project Officer
Malcolm Pirnie, Inc.



Courtney

Ingersoll
Project Manager
Malcolm Pirnie, Inc.


Unexploded

Greg

Peterson
Ordnance Safety Officer
Malcolm Pirnie, Inc.

Malcolm Pirnie, Inc., prepared this report at the direction of the United States Army Corps of Engineers (USACE). This document should be used only with the approval of the USACE. This report is based, in part, on information provided in other documents and is subject to the limitations and qualifications presented in the referenced documents.

September 2009

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TABLE OF ACRONYMS

Acronym	Definition
°F Degrees	Fahrenheit
APC-T	Armor Piercing Capped-Tracer
APERS Anti-personnel	
BD Base	Detonating
BLU	Bomb Live Unit
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CTC	Cost to Complete
CTT	Closed, Transferred, and Transferring
DERP Defense	Environmental Restoration Program
DMM Discarded	Military Munitions
DNT Dinitrotoluene	
DoD	Department of Defense
DOE	Department of Energy
FS Feasibility	Study
FUDS	Formerly Used Defense Site
FY Fiscal	Year
GPS	Global Positioning System
HE High	Explosive
HE-T High	Explosive-Tracer
HRR	Historical Records Review
IEPA	Illinois Environmental Protection Agency
IL Illinois	
IRP	Installation Restoration Program
JOAAP	Joliet Army Ammunition Plant

LAP Load-Assemble-Pack	age
MC Munition	s Constituents
MD Munition	s Debris
MEC	Munitions and Explosives of Concern
MFG	Manufacturing
MGFD	Munition with the Greatest Fragmentation Distance
mm Millim	eter
MMRP Milita	ry Munitions Response Program
MRS	Munitions Response Site
MT Mechanical	Time
NFA No	Further Action
NM Non-	metallic
NPL	National Priorities List
PA Prelim	inary Assessment
PD Point	Detonating
Pirnie	Malcolm Pirnie, Inc.
RA Rem	oval Action
RDX Cyclotrim	ethylene trinitramine
RI Rem	edial Investigation
ROD	Record of Decision
SARA Superfund	Amendment and Reauthorization Act
SI Site	Inspection
Tetryl trinitrophenylm	ethylnitramine
TNT Trinitroto	luene
TP Target	Practice
TPP	Technical Planning Process
U.S. United	States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code

USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UXO Unexploded	Ordnance
UXOSO	Unexploded Ordnance Safety Officer
WWII W	World War II

GLOSSARY OF TERMS

Closed Range – A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component.

Defense Site – Locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions.

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance (UXO), military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations.

Explosive Ordnance Disposal – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of UXO and of other munitions that have become an imposing danger, for example, by damage or deterioration.

Explosives Safety – A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects of risks of potential mishaps involving military munitions.

Formerly Used Defense Site (FUDS) Property – A facility or site (property) that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances. By the Department of Defense Environmental Restoration Program (DERP) policy, the FUDS program

is limited to those real properties that were transferred from DoD control prior to 17 October 1986. FUDS properties can be located within the 50 State, District of Columbia, Commonwealths, and possessions of the United States. (USACE ER 200-3-1, May 2004)

Military Munitions – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, United States Coast Guard, Department of Energy (DOE), and National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents; chemical munitions; rockets; guided and ballistic missiles; bombs; warheads; mortar rounds; artillery ammunition; small arms ammunition; grenades; mines; torpedoes; depth charges; cluster munitions and dispensers; demolition charges; and devices and components thereof.

The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components other than nonnuclear components of nuclear devices that are managed under the nuclear weapons program of the DOE after all required sanitization operations under the Atomic Energy Act of 1954 (42 United States Code [U.S.C.] 2011 et seq.) have been completed.

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, includes UXO, as defined in 10 U.S.C. 101(e)(5); DMM, as defined in 10 U.S.C. 2710(e)(2); and munitions constituents (MC) (e.g., trinitrotoluene [TNT], cyclotrimethylene trinitramine [RDX]) present in high enough concentrations to pose an explosive hazard.

Munitions Constituents (MC) – Any materials originating from UXO, DMM, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions Debris (MD) – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Operational Range – A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities or, although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities.

Range – A designated land or water area set aside, managed, and used for range activities of the DoD. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration.

Transferred Range – A range that is no longer under military control and had been leased by the DoD, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager. Additionally, property that was previously used by the military as a range, but did not have a formal use agreement, also qualifies as a transferred range.

Transferring Range – A range that is proposed to be leased, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An active range will not be considered a transferring range until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been notified).

Unexploded Ordnance (UXO) – Military munitions that (a) have been primed, fused, armed, or otherwise prepared for action; (b) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (c) remain unexploded either by malfunction, design, or any other cause.

EXECUTIVE SUMMARY

The Department of Defense (DoD) established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program to address defense sites with munitions and explosives of concern (MEC) (which include unexploded ordnance [UXO] and discarded military munitions [DMM]) and munitions constituents (MC) located on current and former military installations. Properties classified as operational military ranges, permitted munitions disposal facilities, or operating munitions storage facilities are not eligible for the MMRP. The United States (U.S.) Army's inventory of closed, transferred, and transferring (CTT) military ranges and defense sites identified sites with UXO, DMM, or MC eligible for action under the MMRP. This report presents the results of the MMRP Site Inspection (SI) Addendum for the L2-L3 Extended Buffer Area (JAAP-001-R-02) conducted at Joliet Army Ammunition Plant (JOAAP) located in Will County, Illinois (IL).

The DoD is currently establishing policy and guidance for munitions response actions under the MMRP. However, key program drivers developed to date conclude that munitions response actions will be conducted under the process outlined in the National Contingency Plan (40 Code of Federal Regulations 300) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 United States Code 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499 (hereinafter CERCLA). The *Final U.S. Army Closed, Transferred and Transferring Range/Site Inventory Report*, completed in September 2002 for the JOAAP, marks the completion of the Preliminary Assessment (PA) phase of work under CERCLA. Each of the sites found to be MMRP-eligible in the CTT Range/Site Inventory Report were carried through to the SI phase of the MMRP. In addition, post-SI removal action work identified a potential new Munitions Response Site (MRS) which was determined eligible for the MMRP. An addendum SI is being completed to further evaluate this new MRS. The SI Report and Addendum are part of the CERCLA process and complete the PA/SI requirement for all of the MMRP eligible sites.

Joliet Army Ammunition Plant

JOAAP is located in Will County, IL and was one of the largest and most productive ordnance complexes in the U.S., having assembled over 4 billion pounds of military munitions. JOAAP encompassed approximately 23,000 acres 10 miles south of Joliet, IL and 40 miles southwest of Chicago, IL. All production halted in 1976, and the plant was assigned a nonoperating status in 1977. Closure activities are ongoing at JOAAP.

An SI Report for JOAAP was completed in May 2005 and addressed four MRSs identified during the 2002–2003 CTT Range/Site Inventory. A Historical Records Review (HRR) Addendum, completed in November 2008, identified a new MRS: the L2-L3 Extended Buffer Area (JAAP-001-R-02). This SI Report Addendum is part of the CERCLA process and completes the PA/SI requirement for this newly identified MMRP-eligible site.

The SI Addendum at JOAAP included only MEC field activities, as agreed upon during Technical Project Planning Meeting 2, held on 15 October 2008. Field activities were conducted from 2–5 March 2009. MEC field activities included a geophysical instrument-assisted visual survey of the L2-L3 Extended Buffer Area. The survey was conducted in areas where HRR findings and previous fieldwork indicated a potential for MEC. The goals of the MEC fieldwork were to ascertain the presence of MEC, to determine the appropriate actions, and to complete the MRS Prioritization Protocol for the site. These goals were achieved through the MEC field activities.

A summary of the findings and recommendations for the MRS at JOAAP, based on the results of the SI field activities, is provided in **Table ES-1**.

Table ES - 1: SI Findings and Recommendations

MRS Size	2009 SI Addendum Recommendation	Basis for Recommendation
L2-L3 Extended Buffer Area (JAAP-001-R-02)		
201 acres	RI	MEC and munitions debris (MD) were located on the surface in the L2-L3 Extended Buffer Area (Map 4-2). The L2-L3 Extended Buffer Area footprint has been reduced from a total area of 396 acres to 201 acres (Map 4-4). No MEC or MD were located in the area recommended for exclusion from the MRS.

ACKNOWLEDGMENTS

The Site Investigation Addendum field activities were performed at Joliet Army Ammunition Plant by Malcolm Pirnie, Inc. from 2–5 March 2009 as part of the Military Munitions Response Program for the Department of Defense. The entire Site Inspection process began in February 2004 and is scheduled to conclude in January 2010. Malcolm Pirnie, Inc. would like to acknowledge the following people for their participation and cooperation throughout the Site Inspection process:

United States Army Environmental Command	Ellen Maly MMRP Program Manager
Andrew	Maly MMRP Project Manager
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United States Environmental Protection Agency, Region 5	Tom Barounis Restoration Project Manager
Illinois Environmental Protection Agency	Nicole Wilson Project Manager
Joliet Army Ammunition Plant Comm	Art Holz Owner's Representative JOAAP
	Tim Jeremiah Industrial Specialist
United States Department of Agriculture	Wade Spang Prairie Supervisor
Malcolm Pirnie, Inc. Courtney Project	Ingersoll Manager
Catherin	Kelly Field Project Manager
Greg	Peterson Unexploded Ordnance Safety Officer

1. INTRODUCTION

1.1 MILITARY MUNITIONS RESPONSE PROGRAM OVERVIEW

The Department of Defense (DoD) established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program (DERP) to address unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) located on current and former military installations. Properties classified as operational military ranges, permitted munitions disposal facilities, or operating munitions storage facilities are not eligible for the MMRP. The United States (U.S.) Army's inventory of closed, transferred, and transferring (CTT) military ranges and defense sites identified sites with munitions and explosives of concern (MEC) (which include UXO and DMM) and/or MC that are eligible for action under the MMRP. Each of the sites found to be MMRP-eligible in the CTT Range/Site Inventory Report were carried through to the Site Inspection (SI) phase of the MMRP. In addition, post SI-removal action work identified a potential new Munitions Response Site (MRS) which was determined eligible for the MMRP. An addendum SI is being completed to further evaluate this MRS. This report presents the results of the MMRP SI Addendum for the L2-L3 Extended Buffer Area (JAAP-001-R-02) conducted at Joliet Army Ammunition Plant (JOAAP) located in Will County, Illinois (IL).

The DoD is currently establishing policy and guidance for munitions response actions under the MMRP. However, key program drivers developed to date conclude that munitions response actions will be conducted under the process outlined in the National Contingency Plan (40 Code of Federal Regulations 300) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 United States Code (U.S.C.) 9605, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, Pub. L. 99-499 (hereinafter CERCLA). The *Final U.S. Army Closed, Transferred and Transferring Range/Site Inventory Report*, completed in September 2002 at the JOAAP, marks the completion of the Preliminary Assessment (PA) phase of work under CERCLA. The SI Report and Addendum is part of the CERCLA process and completes the PA/SI requirement for the MMRP-eligible sites.

Malcolm Pirnie, Inc. (Pirnie) is performing this SI Addendum for JOAAP from April 2008 to January 2010.

The initial CTT Range/Site Inventory was completed in 2002 and identified four MRSs at JOAAP:

- Demolition Area (L3) (JAAP-001-R-01)
- Explosive Burning Ground 1 (L2) (JAAP-002-R-01)
- Training Area 7 (JAAP-003-R-01)
- Former Burning Area (L34) (JAAP-004-R-01)

Following a Historical Records Review (HRR) in February 2005, an SI was completed in May 2005. This SI recommended no further action (NFA) at Training Area 7 (JAAP-003-R-01). A non-time critical removal action was recommended at Former Burning Area (L34) (JAAP-004-R-01) and completed in 2007. The Former Burning Area (JAAP-004-R-01) was considered response complete in 2008 and is currently undergoing completion of the CERCLA documentation for NFA. Currently, the action memorandum is being prepared for the implementation of the 2000 Engineering Evaluation/ Cost Analysis (EE/CA). The NFA decision document will be completed for all JOAAP MMRP sites as part of the Record of Decision for the L2-L3 Extended Buffer Area (JAAP-001-R-02).

Further investigation was recommended for the Explosive Burning Ground 1 (L2) (JAAP-002-R-01) and the Demolition Area (L3) (JAAP-001-R-01). Based on this recommendation, a removal action (RA) was undertaken in 2007 at L2 (JAAP-002-R-01) and L3 (JAAP-001-R-01), a 200-foot buffer area surrounding the Installation Restoration Program (IRP) sites, L2 and L3. During the RA, MEC were located beyond this buffer area, likely the result of kick-out from munition demolition activities at the site. An additional area of concern was identified as a result of the findings of the RA, and it was determined this area was eligible for the MMRP. An approximate boundary was established for further SI as determined by the munition with the greatest fragmentation distance (MGFD). The contractor who conducted the characterization documented an explosive-filled 105 mm M1 and deemed this the MGFD (Historical Records

Review, November 2008). This was used to extrapolate the resulting MRS which contained approximately 396 acres and was named the L2-L3 Extended Buffer Area (JAAP-001-R-02).

This SI Report Addendum details the field activities conducted at this newly identified MRS and conclusions and recommendations based on findings from the field activities. Pirnie performed the SI Addendum field activities at the L2-L3 Extended Buffer Area (JAAP-001-R-02) at JOAAP from 2–5 March 2009.

1.2 PURPOSE, SCOPE, AND OBJECTIVES

The primary goal of the SI Addendum is to collect a sufficient amount of information necessary to make one of the following decisions: 1) whether a Remedial Investigation (RI) / Feasibility Study (FS) is required at a site, 2) whether an immediate response is needed, or 3) whether the site qualifies for NFA. The secondary goal of the SI is to collect information for building the MMRP, including cost to complete (CTC) estimates and site prioritization for the MMRP-eligible sites.

The SI Addendum at JOAAP investigated the presence of MEC for the newly-identified MRS mentioned in Section 1.1 in order to fulfill these goals. The field activities for the SI Addendum were not intended to confirm all types of MEC present, determine MEC density, or define the limits of the MEC impacts.

1.3 PROJECT DRIVERS

The key legislative, administrative, and historical precedents for managing MMRP sites include the following:

DERP Management Guidance (September 2001)

The DERP Management Guidance established an MMRP element for UXO, DMM, and MC defense sites. The history of DERP dates back to the SARA of 1986. The scope of the DERP is

defined in 10 U.S.C. §2701(b), which states:

Goals of the program shall include the following: (1) the identification, investigation, research and development, and cleanup of contamination from hazardous substances, and pollutants and contaminants; (2) correction of other environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment.

Army DERP Management Guidance for Active Installations (November 2004)

The Army DERP Management Guidance provides guidance for active installations and non-Base Realignment and Closure (BRAC) excess properties on the management of the Army IRP, the MMRP, and the Building Demolition and Debris Removal Program categories that are related to environmental cleanup. The Army DERP Management Guidance does not apply to Army restoration activities overseas, the BRAC Environmental Restoration Program, the Compliance-Related Cleanup Program, or the FUDS Restoration Program. The guidance document was provided to implement the Army's DERP in accordance with the DoD DERP Management Guidance (September 2001). The Army DERP Management Guidance supplements the roles, responsibilities, and procedures contained in Army Regulation 200-1 and Department of the Army Pamphlet 200-1.

National Defense Authorization Act (Fiscal Year [FY] 02) (Sections 311–312)

Sections 311–312 of the National Defense Authorization Act of FY02 reinforced the DoD's 2001 DERP Management Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain MEC or MC. Section 311 requires the DoD to develop a protocol for prioritizing defense sites for response activities in consultation with the states and tribes. Section 312 requires the DoD to create a separate program element to ensure that the DoD can identify and track munitions response funding.

The September 2001 DoD DERP Management Guidance and the National Defense Authorization Act of FY02, described above, established the MMRP. The DERP and the MMRP provide guidance and methods for conducting a baseline inventory of defense sites containing, or potentially containing, UXO, DMM, or MC.

2. INSTALLATION OVERVIEW

JOAAP is located in Will County, IL and was one of the largest and most productive ordnance complexes in the United States, having assembled over 4 billion pounds of military munitions. It encompassed approximately 23,000 acres 10 miles south of Joliet, IL and 40 miles southwest of Chicago, IL (marked by the red star in **Figure 2-1**).



Figure 2-1: Location of JOAAP

JOAAP was constructed on agricultural land in the early 1940s for the purpose of munitions production in support of the U.S. involvement in World War II (WW II). It was built as two separate units: the Elwood Ordnance Plant, consisting of 14 square miles, and the Kankakee Ordnance Works, consisting of 22 square miles. These units later were referred to as the Load-Assemble-Package (LAP) Area and the Manufacturing (MFG) Area, respectively (**Figure 2-2**). The two units were joined in 1946 and became known as the Joliet Arsenal.

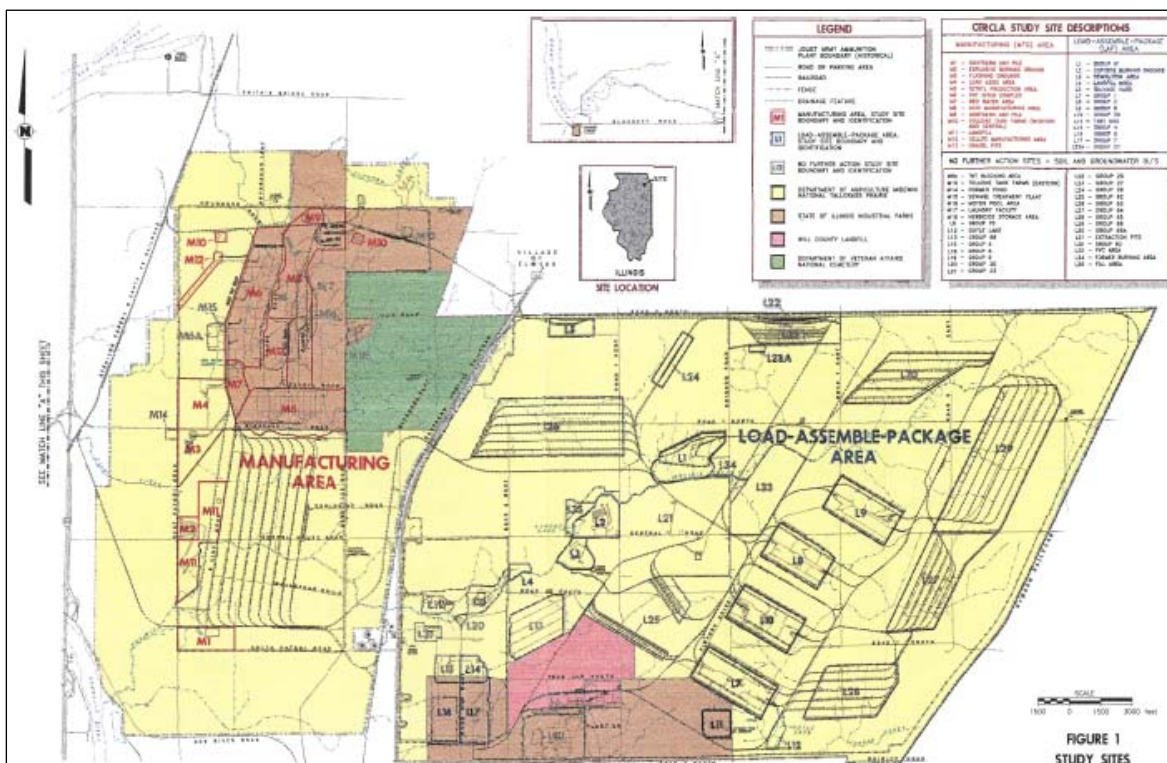


Figure 2-2: MFG Area and LAP Area at JOAAP

Joliet Arsenal was the nation's largest ammunition manufacturer at the end of WWII. When the Uniroyal Chemical Company (the n known as the U.S. Rubber Company) assumed operational responsibility for both plants in 1965, it was renamed the Joliet Army Ammunition Plant. Production facilities went on inactive or standby status when demand decreased; some of the facilities were leased for commercial use at that time. During times when production was halted, activities at the plant included demilitarization of deteriorated and obsolete ammunition items, as well as loading nonstandard research and development ammunition items. The plant was reactivated and production commenced during the Korean and Vietnam conflicts. All production halted in 1976, and the plant was assigned a nonoperating status in 1977.

The MFG Area produced explosives, including trinitrotoluene (TNT), dinitrotoluene (DNT), trinitrophenylmethylnitramine (tetryl), and other constituent chemicals. The LAP Area assembled and packaged bombs, projectiles, fuzes, and supplementary charges almost without interruption from WWII through 1975. Some of the munitions produced included the standard

105-millimeter (mm) high explosive (HE) M1 cartridge, the 8-inch howitzer HE projectile, 40 mm cartridges, and M14 mines. The property contained 392 igloos for munitions storage.

Congress placed the MFG Area on the National Priorities List (NPL) in July 1987 and placed the LAP Area on the NPL in March 1989. JOAAP was placed on Inactive-Modified Caretaker Status, and the Army declared the 23,000 acres excess property in 1993. As determined by the Illinois Land Conservation Act of 1995, approximately 19,100 acres would be transferred to the U.S. Department of Agriculture (USDA) for the establishment of the Midewin National Tallgrass Prairie; the rest of the property would be used for a national veteran's cemetery, a landfill, and two industrial parks. JOAAP is currently undergoing closure activities in order to complete the transfer of lands.

2.1 PREVIOUS INVESTIGATIONS

After concluding that MEC potentially were located outside the IRP boundaries of L2 and L3 during the 2005 HRR, a 200-foot buffer area was delineated around each site for further investigation and was determined eligible for the MMRP; the resulting MRSs were named L2 (JAAP-002-R-01) and L3 (JAAP-003-R-01) and are shown on Map 2-1. An RA to a depth of 1 foot was completed at the two MRSs in 2007. MEC were located at the outer boundary of the MRSs, suggesting MEC may be present beyond this boundary. The U.S. Army Corps of Engineers (USACE) and a contractor conducted a random site walk; their findings confirmed MEC were located beyond the MRSs. Detailed descriptions of the previous investigations conducted at JOAAP are presented in the HRR Addendum (Malcolm Pirnie, 2008).



FINAL
Map 2-1
Overview of MRSS

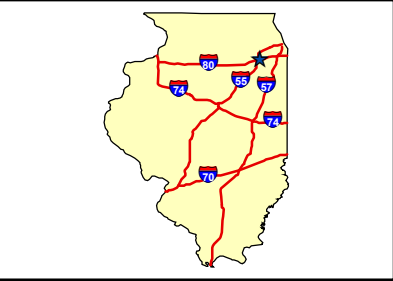
Legend

- Historical LAP Area**
- Historical LAP Area
 - Railroad
 - Road
 - Stream
 - Water
 - New MRS (June 2008)
 - Previous MRS (May 2005)

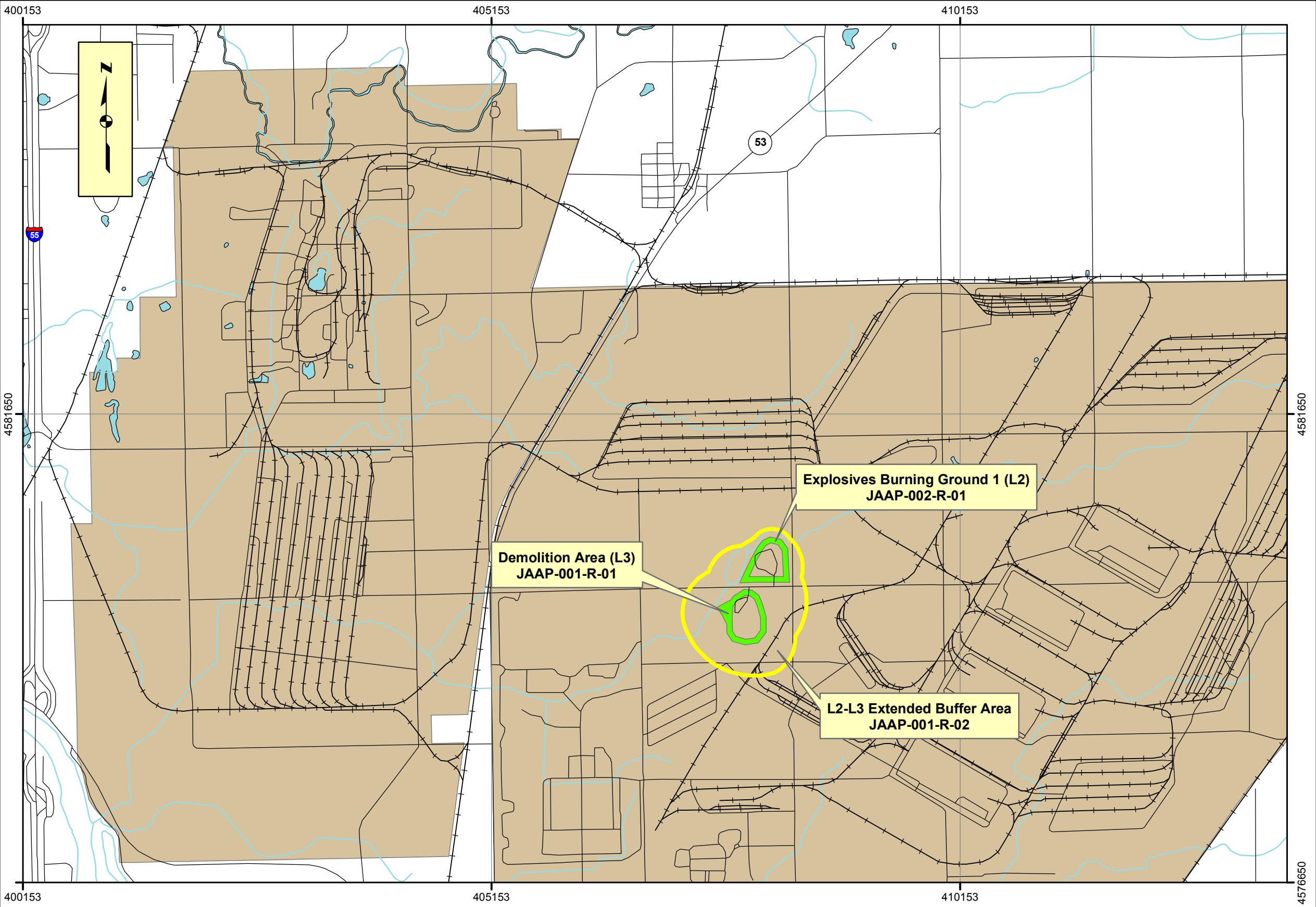
Coordinate System: UTM, Zone 16
Horizontal Datum: NAD83
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final
Date: September 2009

0 0.25 0.5 1
Miles



Source: Adapted from SI Report, May 2005.



3. SITE INSPECTION OVERVIEW

3.1 SITE INSPECTION TASKS

In order to complete the JOAAP SI Addendum, field activities were conducted from 2–5 March 2009 at the L2-L3 Extended Buffer Area (JAAP-001-R-02). Field activities included a geophysical instrument-assisted visual survey. The survey was conducted in the MRS where HRR findings and previous field investigations indicated a potential for MEC. The purpose of the field activities was to collect sufficient information to support one of the following decisions for the MRS: 1) whether an RI/FS is required, 2) whether an immediate response is needed, or 3) whether the site qualifies for NFA.

The goal of the field activities at the L2-L3 Extended Buffer Area (JAAP-001-R-02) was to determine if MEC are present on the ground surface. Due to the potential hazards associated with the presence of MEC, the UXO Safety Officer (UXOSO) escorted the field team members during the reconnaissance activities using MEC avoidance techniques. The locations of encountered MEC and/or munitions debris (MD) items were recorded using a handheld Global Positioning System (GPS) unit, each item was documented in the field log book, and an MEC/Multiple Anomaly Discovery Form was completed for each item found.

As agreed upon by the Illinois Environmental Protection Agency (IEPA), United States Environmental Protection Agency (USEPA), and stakeholders at the Technical Project Planning (TPP) Meeting 2 on 15 October 2008, no MC activities were completed for the SI Addendum. It was determined the site has been characterized sufficiently in previous sampling efforts, and the 2004 Record of Decision (ROD) granted an NFA determination for soils. Future MC investigation in the L2-L3 Extended Buffer Area is dependent upon the presence of MEC in the area and would occur during an RI, if warranted.

Field activities conducted at JOAAP were dictated by the results of the TPP Meeting 2 held on 15 October 2008, decisions made after the TPP session, and comments to the Work Plan (finalized in February 2009). **Table 3-1** and **Table 3-2** summarize the TPP decisions that

determined the field activities. Details regarding the field procedures are presented in the SI Addendum Work Plan (Malcolm Pirnie, 2009). A summary of field activities conducted at the MRS as part of the SI Addendum work is provided in Section 4.

Table 3-1: Summary of MEC TPP Decisions

MRS	MEC SI Activities	
	Activity	Purpose
L2-L3 Extended Buffer Area (JAAP-001-R-02)	Conduct geophysical instrument-assisted visual survey of 10% of the site.	To support MEC NFA or RI determination. If no MEC are identified, the site qualifies for NFA. If MEC are found, the site will move to an RI.

Table 3-2: Summary of MC TPP Decisions

MRS	MC SI Activities	
	Activity	Purpose
L2-L3 Extended Buffer Area (JAAP-001-R-02)	No MC activities were recommended for this MRS under the SI.	Previously collected data will be used to support CTC/prioritization and RI or NFA determination. It was determined that the site has been characterized sufficiently in previous sampling efforts.

3.2 SITE INSPECTION FINDINGS

The results of the SI field activities conducted at JOAAP, including MEC findings for the MRS, are discussed in Section 4. The MEC and/or MD items identified, as well as other significant visual observations, were recorded using a Trimble Geoexplorer XT handheld GPS unit. The field notes and observations made during the SI Addendum field activities are summarized in Appendix A (Field Notes) and Appendix B (Field Forms and Photographic Log). Geographic coordinates of field observations (including MEC, MD, and other notable items) are provided in Appendix C. The TPP Meeting 2 minutes are provided in Appendix D. The MRS Prioritization Protocol tables are included in Appendix E.

4. SITE INSPECTION DETAILS

This section presents the site-specific information for the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS at JOAAP, including a site description and historical overview, an overview of the fieldwork activities that occurred on the MRS, the results of the fieldwork, the conceptual site model, a site summary, and site recommendations.

4.1 L2-L3 EXTENDED BUFFER AREA (JAAP-001-R-02)

4.1.1 Site Description and Historical Overview

The HRR Addendum -proposed L2-L3 Extended Buffer Area (JAAP-001-R-02) was approximately 396 acres and surrounds the 200-foot buffer areas, L2 (JAAP-002-R-01) and L3 (JAAP-001-R-01) MRSs. This new MRS, L2-L3 Extended Buffer Area (JAAP-001-R-02), was first identified during the 2007 RA that occurred at the L2 (JAAP-002-R-01) and L3 (JAAP-001-R-01) MRSs. MEC were discovered at the boundary of the L3 (JAAP-001-R-01) MRS and near the boundary of the L2 (JAAP-002-R-01) MRS, indicating MEC likely were present beyond the MRS boundaries. A follow-on magnetometer-assisted survey conducted by the USACE and a contractor confirmed MEC were present beyond the boundary designated for the RA at the L2 (JAAP-002-R-01) and L3 (JAAP-001-R-01) MRSs.

The MEC located beyond the L2 (JAAP-002-R-01) and L3 (JAAP-002-R-01) MRS boundaries are likely a result of kick-out from the munition demolition activities at the site. This additional area of concern was identified as a result of the RA and was determined to be eligible for the MMRP. An approximate boundary as determined by the MGFD was established in the HRR Addendum for further SI and included approximately 396 acres; however, findings during field activities would dictate the final boundary and acreage. The resulting MRS was named the L2-L3 Extended Buffer Area (JAAP-001-R-02).

Currently, the property has been transferred to the USDA, and a portion of the land is leased for agriculture. The central portion of the MRS is wooded and undeveloped.

4.1.2 Fieldwork Activities

Munitions and Explosives of Concern Activities and Purpose

Based on information presented in the HRR Addendum, the potential for MEC at the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS exists; therefore, MEC activities to determine presence were performed, including a geophysical instrument-assisted visual survey of approximately 10% of the 396-acre site. As agreed upon by Stakeholders, the Work Plan (February 2009) established that areas previously surveyed during summer 2007 by USACE and the contractor would not be re-surveyed during the SI Addendum field activities. This area included approximately 54 acres.

A UXOSO escorted the field personnel on random transects which were presented in the EPA-approved Work Plan (February 2009). Transects spanned across the entire site, with the exception of small portions which were inaccessible due to terrain or a locked gate; however, activities completed in the field included more transects than those proposed in the Work Plan. The UXOSO used an all-metals detector for anomaly avoidance and to aid in the detection of metal objects on the surface that may have been covered by vegetation. A small area in the southwest corner was enclosed inside a locked fence and was not accessible. A creek, a pond, and a swampy area limited transects surveyed southwest of L3 (JAAP-001-R-01). A swamp and Prairie Creek restricted access to the area immediately west and north of L2 (JAAP-002-R-01). A map of transects surveyed is provided as **Map 4-1**, with approximately 54 acres of inaccessible areas highlighted in pink on the map. Of the 396 acres included in the L2-L3 Extended Buffer Area (JAAP-001-R-02), 54 acres were previously surveyed and 54 acres were inaccessible. Of the remaining 288 acres, approximately 30 acres, or 10.4%, were visually surveyed.

4.1.3 Fieldwork Results

Munitions and Explosives of Concern Results

Visibility was maintained for a width of 10 feet on all transects, except where limited by thick brush as recorded in the field notes included in Appendix A.

No unusual pits, craters, or mounds were encountered. Foundations of former buildings and old pipes were located in the far southeast corner and in the inner section of the southwest boundary of the L2-L3 Extended Buffer Area (JAAP-001-R-02). No MD or MEC were located in the vicinity. **Map 4-2** depicts the areas where the foundations and pipes were encountered as orange circles.

Two unidentified metallic objects were located at the inner boundary of the southeast corner of the L2-L3 Extended Buffer Area (JAAP-001-R-02). Photographs are included in Appendix B. A scattered junk pile was found in the same area, and the metallic objects are likely associated with the junk pile; however, they were not confirmed or denied as MD and, therefore, are marked as unidentified metallic objects. Locations where the junk pile and metallic objects were found are shown as purple and green circles, respectively, on **Map 4-2**.

Six surface anomalies located during the survey were identified by the UXOSO as MD; all were left in place. **Map 4-2** depicts the locations where MD was found as yellow circles. Only one item (part of a base from a 155-mm projectile) was found beyond the L2 (JAAP-002-R-01) MRS boundary. Two items were found in the woods east of the L3 (JAAP-001-R-01) MRS near items found by the USACE during the 2007 random survey. Three MD items were located in the agricultural fields east of the L3 (JAAP-001-R-01) MRS. After identifying the objects in the agricultural fields, tighter grids were surveyed surrounding these pieces of MD. The grids extended approximately 150 feet north and south of the object, and 50-foot transects were surveyed moving east beyond the MD until no other MEC/MD was located for a distance of 100 feet. **Map 4-3** shows these tighter transects that were surveyed.

Details of the MD encountered are provided on the MEC/Multiple Anomaly Discovery Forms included in Appendix B. Further details regarding the survey are included in field notes provided in Appendix A.

4.1.4 Conceptual Site Model

4.1.4.1 *Military Munitions Response Program Site Profile*

4.1.4.1.1 *Area and Layout*

The L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS survey area included approximately 396 acres and is located in the west-central portion of the LAP Area at JOAAP. Central Road runs east-west through the central part of the site, Coldwater Road runs north-south through the eastern part of the site, and an unnamed road runs east-west through the southern part of the site. Prairie Creek flows to the southwest cutting through the west-central portion of the site. Most of the site is used for agriculture, while remaining areas are wooded or open grassy field. A small cemetery is located west of the L3 (JAAP-001-R-01) MRS. None of the site is used for residential purposes.

4.1.4.1.2 *Structures*

No structures are located on the site. Old foundations and piping were located west, southwest, and southeast of the L3 (JAAP-001-R-01) MRS, but no intact structures or pipes were located. The locations of these former foundations are depicted on **Map 4-2** as orange circles.

4.1.4.1.3 *Utilities*

The L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS is primarily used for agricultural purposes. An electrical line runs east-west along the unnamed road in the southern part of the site. Specific information on the locations of other utilities at the site is unknown.

4.1.4.1.4 *Boundaries*

The L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS is bordered on all sides by agricultural land with small undeveloped wooded areas located southwest and northeast of the site. Part of the former magazine storage area is located in the south-southwest area of the site and is fenced and locked. This land may be used for grazing.

4.1.4.1.5 *Security*

The public has no access to the IRP sites, L2 and L3; they are surrounded by a fence with a locked gate. Only two keys exist for the lock, and all visitors must be accompanied by facility personnel. The L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS has limited public access.

4.1.4.2 Physical Profile

4.1.4.2.1 Climate

Average summer temperatures at JOAAP are in the 70s degrees Fahrenheit (°F), while average winter temperatures are in the 20s. July is the warmest month of the year, with an average maximum temperature of 84.6 °F; January is the coldest month of the year, with an average minimum temperature of 13.5 °F. Precipitation generally is distributed evenly throughout the year, but July tends to be the wettest month, receiving an average of 4.34 inches of rain. Average annual precipitation is 36.96 inches, with an average of 17 inches of snow per year (*IDcide – Location Information Data Server*, 2009).

4.1.4.2.2 Geology

At JOAAP, two glacial deposits have been identified: the Henry and the Wedron formations. The Henry Formation underlies most of the outwash plain in the central and western parts of the MFG Area. It is 5 to 25 feet thick, and includes sandy and gravelly silts and distinct beds of sand and gravel. The Wedron Formation is extensive in the upland area east of the main part of the MFG Area. This formation till is composed of clayey silt with minor sand. The combined thickness of the Wedron and Henry formations is generally less than 25 feet in the western part of the MFG Area. In the eastern part of the MFG Area, the thickness increases to 60–70 feet (*Draft Semi-Annual Report for the Groundwater Operable Unit—Long-Term Monitoring Report, Spring Sampling Event 2006*, March 2008).

The Silurian dolomite is the underlying bedrock throughout the MFG Area. In numerous boring logs, the dolomite is described as a fine-grained rock, commonly pyritic, and in some places includes shaley beds. The dolomite is yellow or yellow-brown where it is weathered and gray or greenish gray otherwise (*Draft Semi-Annual Report for the Groundwater Operable Unit—Long-Term Monitoring Report, Spring Sampling Event 2006*, March 2008).

4.1.4.2.3 Topography

JOAAP is located within the northern part of the extensive Central Lowlands physiographic province, which is characterized by relatively flat topography and low relief. The most prominent topographic feature is a 50-foot-high escarpment that trends generally north-south through the installation. JOAAP lies within the fork of the confluence of the Des Plaines and

Kankakee rivers. Most of the LAP Area drains to the Kankakee River. The Grant Creek and Prairie Creek drainage basins cover approximately 70% of the installation, and the Jackson Creek drainage basin covers the remainder. Jackson and Grant creeks are tributaries of the Des Plaines River, whereas Prairie Creek eventually discharges to the Kankakee River. Man-made ditches facilitate drainage to these creeks from the sites (U.S. Department of the Army, 1998).

4.1.4.2.4 Soil

A 1994 Phase 2 RI described the soil at JOAAP as follows:

JOAAP contains five distinct soil associations. Groups I and II are termed “upland soils” and have developed over unstratified, calcareous, silty clay and glacial till. The lowland soils—Groups III, IV, and V—have developed west of the escarpment. Group III is developed over 5 feet of medium-textured glacial outwash. Group IV is developed over 5 feet of medium-textured outwash. Group V is developed over a stringer of calcareous, porous, loamy gravel outwash.

The five soil associations at JOAAP are described as follows:

Elliott-Ashkum Soil Association (Group I) —The surface 12 to 15 inches of this soil consist of dark gray silt loam-to-silty clay loam; the subsoil consists of 15 to 20 inches of firm brown silty clay. This soil—developed under prairie vegetation—is high in organic matter and water-holding capacity, is slightly acidic to neutral, and has a low permeability.

Blount Soil Association (Group II) —The surface 9 inches of this soil consist of dark gray friable silt loam; the subsoil consists of 21 inches of firm brown silty clay. This soil group developed under a deciduous hardwood forest and is low in organic matter, water-holding capacity, pH (4.7 to 6.0), and permeability.

Drummer-Brenton Soil Association (Group III) —The top 14 inches consist of black silt loam-to-silty clay loam; the subsoil consists of 21 to 27 inches of dark gray firm silty clay loam. This soil, developed under marsh and prairie vegetation, is high in organic matter and water-holding capacity, is slightly acidic to neutral, and has a moderately low permeability.

Joliet-Millsdale Soil Association (Group IV) —The surface 14 inches of this soil consist of black friable silty clay loam; the subsoil consists of 6 to 20 inches of grayish-brown firm silty clay loam. This soil—developed under prairie vegetation—is high in organic matter and water-holding capacity, is neutral to slightly alkaline, and has a low permeability.

Lorenzo-Rodman Soil Association (Group V) —This soil consists of 7 to 17 inches of dark brown friable silty-to-gravelly loam. It is approximately neutral,

moderately high in organic matter, low in water-holding capacity, and has a high permeability.

4.1.4.2.5 Hydrogeology

The hydrogeology of the area is subdivided into four aquifer systems and major confining beds. From the uppermost downward, the aquifer systems are (1) the glacial drift (Pleistocene glacial deposits), (2) shallow bedrock (Silurian dolomites), (3) Cambrian-Ordovician (sandstones and dolomites), and (4) Mount Simon (Cambrian sandstone). Groundwater flow at the MFG Area is generally westward but is influenced locally by streams that are incised into the glacial drift. Groundwater flow occurs in several aquifers beneath the installation. The shallow overburden aquifer is composed of glacial drift and is underlain by the Silurian dolomite water-bearing zone. Deeper bedrock aquifers are isolated from the shallow aquifer by low-permeability shale beds in the Maquoketa Group. Groundwater at the installation has been determined to be both Class I (potable) and Class II (nonpotable general resource). The IEPA has classified the glacial drift aquifer as Class II because its low yield does not supply usable quantities of groundwater. The Silurian dolomite is considered a Class I groundwater resource and has limited use near the installation as a water source despite elevated levels of sulfate and iron (U.S. Department of the Army, 1998).

4.1.4.2.6 Hydrology

A 1994 Phase 2 RI described the hydrology at JOAAP, and site conditions have not changed since this report. JOAAP lies within the fork of the confluence of the Des Plaines and Kankakee Rivers, with most of the LAP Area draining to the Kankakee River. Grant Creek drains a small portion of the northwestern corner of the LAP Area before reaching the MFG Area and ultimately flowing to the Des Plaines River. Prairie Creek drains the majority of the LAP Area and flows westerly through the MFG Area to the Kankakee River. Jordan Creek and Spoil Bank Creek drain the remainder of the LAP Area and discharge to the Kankakee River south of JOAAP.

The Federal Emergency Management Agency has produced 100-year flood maps indicating that part of the LAP Area is subject to flooding.

4.1.4.2.7 *Vegetation*

The woodlands at JOAAP are primarily a mix of hardwood species, including oaks, maples, ashes, black walnut, shagbark hickory, cottonwood, elms, locusts, box elder, osage orange, black cherry, hackberry, red mulberry, Kentucky cove tree, field cedar, and hawthorne. JOAAP is located in the tallgrass prairie region, and vegetation includes both upland and lowland grasses. Lowland species include Indian grass and switchgrass; upland species include little bluestem and sideoats grama (U.S. Department of the Army, 1978).

4.1.4.3 *Land Use and Exposure Profile*

4.1.4.3.1 *Current Land Use / Activities*

Land included in the L2-L3 Extended Buffer Area (JAAP-001-R-02) primarily is used for agricultural purposes; a small portion is undeveloped and wooded.

4.1.4.3.2 *Current Human Receptors*

The current human receptors on the L2-L3 Extended Buffer Area include off-site residents, installation personnel, trespassers, and authorized contractors or workers working in the L2-L3 Extended Buffer Area (JAAP-001-R-02).

4.1.4.3.3 *Potential Future Land Use*

The planned future use for this site is open space for the USDA Midewin National Tallgrass Prairie.

4.1.4.3.4 *Potential Future Human Receptors*

Future receptors are off-site residents, trespassers, and public recreational users, including prairie workers.

4.1.4.3.5 *Zoning / Land Use Restrictions*

The site-specific zoning is unknown, but the area is fenced and monitored by the USDA. Partial open access is available.

4.1.4.3.6 *Beneficial Resources*

There are no known beneficial resources specific to the L2-L3 Extended Buffer Area (JAAP-001-R-02); however, JOAAP lies within the Midewin National Tallgrass Prairie, an ecological area designated by the Illinois Land Conservation Act in 1996. It is the first national tallgrass

prairie in the country and spans 15,454 acres. The preserve was created with the objectives of enhancing, restoring, and conserving native flora and fauna; providing opportunities for environmental education and research; allowing continuation of existing agriculture; and providing appropriate recreational activities. The preserve contains agricultural fields, hardwood forests, creeks, and ponds. It supports a variety of flora and fauna.

4.1.4.3.7 *Demographics/Zoning*

The L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS lies within Will County, IL. The 2000 U.S. Census lists the population of Will County as 502,266 residents, and land area is 837 square miles.

4.1.4.4 *Ecological Profile*

4.1.4.4.1 *Habitat Type*

The HRR Addendum -proposed L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS contains approximately 396 acres of land used for agriculture or undeveloped grasslands and wooded area. No residential areas are present on the site. The areas open to the public are available for hunting, as monitored by the USDA.

4.1.4.4.2 *Degree of Disturbance*

The degree of disturbance at the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS is high, as the area is developed farmland that is regularly disturbed during agricultural activities (e.g., planting, harvesting).

4.1.4.4.3 *Ecological Receptors*

An ecologist at Midewin National Tallgrass Prairie confirmed grassland birds are the only threatened and endangered species that might be impacted at JOAAP. These birds include bobolinks, upland sandpipers, and Henslow's sparrows, which have been spotted west of Prairie Creek and north of Central Road. The area supports a variety of flora and fauna in terrestrial and aquatic habitats.

4.1.4.5 *Munitions/Release Profile*

4.1.4.5.1 *Munitions Types **Maximum** Probability Penetration Depth*

MEC and **MD** kicked out of demolition shots do not have an associated maximum probability penetration depth, as they are not fired. Typically, **MEC** and **MD** deposited due to demolition operations are on or near the ground surface. Therefore, it is assumed that any potential **MEC** or **MD** that may remain within the MRS would be found at or just below the ground surface.

4.1.4.5.2 *Munitions and Explosives of Concern Density*

A geophysical instrument-assisted visual survey was conducted to verify the presence or absence of **MEC** within the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS. It was agreed upon during TPP 2 that approximately 10% of the 396-acre MRS would be visually surveyed during SI Addendum field activities. No **MEC** were observed during the SI Addendum field activities; however, a random site walk conducted by the USACE in 2007 did confirm **MEC** were located beyond the L3 (JAAP-001-R-01) MRS to the east, southeast, south, and southwest of the site. **MEC** were confirmed during the USACE site walk out to distances of 900 feet to the east and southeast, 350 feet to the south, and 50 feet to the southwest of the L3 (JAAP-001-R-01) MRS boundary, as shown on **Map 4-2**.

The survey conducted during the SI Addendum verified the USACE findings. Although **MEC** was not found, **MD** was located on the east and southeast sides of the L3 (JAAP-001-R-01) MRS at 900 feet, on the south side at 350 feet, and on the southwest side at 50 feet as discussed above, and out to distances of 1200 feet, 400 feet, and 500 feet, respectively (**Map 4-2**). Based on this evidence, it is believed that **MEC** could be present out to distances of 1200 feet, 400 feet, and 500 feet from the outer boundaries of the L3 (JAAP-001-R-01) MRS on the east/southeast, south, and southwest sides, respectively. These distances were established based on the farthest distance **MD** was discovered during the SI Addendum and USACE investigations.

Table 4-1 presents a summary of the types of munitions that could be expected. These were presented in the HRR Addendum as munitions and components handled at IRP sites L2 (Explosive Burning Ground) and L3 (Demolition Area). Also presented in this table is the mechanism by which munitions would be expected to be released to the environment if present.

4.1.4.5.1 *Maximum Probability Penetration Depth*

MEC and MD kicked out of demolition shots do not have an associated maximum probability penetration depth, as they are not fired. Typically, MEC and MD deposited due to demolition operations are on or near the ground surface. Therefore, it is assumed that any potential MEC or MD that may remain within the MRS would be found at or just below the ground surface.

4.1.4.5.2 *Munitions and Explosives of Concern Density*

A geophysical instrument-assisted visual survey was conducted to verify the presence or absence of MEC within the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS. It was agreed upon during TPP 2 that approximately 10% of the 396-acre MRS would be visually surveyed during SI Addendum field activities. No MEC were observed during the SI Addendum field activities; however, a random site walk conducted by the USACE in 2007 did confirm MEC were located beyond the L3 (JAAP-001-R-01) MRS to the east, southeast, south, and southwest of the site. MEC were confirmed during the USACE site walk out to distances of 900 feet to the east and southeast, 350 feet to the south, and 50 feet to the southwest of the L3 (JAAP-001-R-01) MRS boundary, as shown on **Map 4-2**.

The survey conducted during the SI Addendum verified the USACE findings. Although MEC was not found, MD was located on the east and southeast sides of the L3 (JAAP-001-R-01) MRS at 900 feet, on the south side at 350 feet, and on the southwest side at 50 feet as discussed above, and out to distances of 1200 feet, 400 feet, and 500 feet, respectively (**Map 4-2**). Based on this evidence, it is believed that MEC could be present out to distances of 1200 feet, 400 feet, and 500 feet from the outer boundaries of the L3 (JAAP-001-R-01) MRS on the east/southeast, south, and southwest sides, respectively. These distances were established based on the farthest distance MD was discovered during the SI Addendum and USACE investigations.

Table 4-1: Summary of Potential MEC Types – L2-L3 Extended Buffer Area

MRS	MD/MEC Observed During SI Field Activities	Items Manufactured and/or Handled at JOAAP¹	Primary Release Mechanism
L2-L3 Extended Buffer Area (JAAP-001-R-02)	155 mm APERS Ogive 155 mm base plate (1/3) Remains of PD projectile fuze Nose fuze adapter 76 mm steel shot from canister projectile	155 mm shrapnel (MK1) 4.5-inch rocket (M16) 90 mm, HE-T (M71E1) 81 mm mortar, HE without fuze 75 mm APC-T (M61A1) without fuze BD (M66A1) 37 mm, TP (M63 Mod 1) Mine, antitank (M4 and NM M5) BLU-26/B Primer (M1A2, M22A2, M28A2&3, M31A2, M40A1, M46-49) Fuze; antitank mine, BD, MT, proximity Mk 29 auxiliary booster depth mines Mk III adapter-boosters M66A1 M1 mines M1A1 mines M5 antitank mines Booster cup assembly for M21A4 booster Tracer assembly M66A1 fuze 75 mm base plugs	Kick out and fragmentation from demolition operations conducted at L3

Note:

APC-T: Armor Piercing Capped-Tracer

APERS: Anti-personnel

BD: Base Detonating

BLU: Bomb Live Unit

HE-T: High Explosive Tracer

MT: Mechanical Time

NM: Non-metallic

PD: Point Detonating

TP: Target Practice

1: Historical Records Review for Other Than Operational Ranges at JOAAP, 2005; and Engineering Evaluation and Cost Analysis for Sites L2, L3, L11, L16, L21, and L34, 1999.

The SI Addendum and USACE surveys located MEC and MD evidence in the L2-L3 Extended Buffer Area (JAAP-001-R-02). This evidence indicates that some percentage of the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS to the east and southeast has moderate to heavy MEC and/or MD present, and the south and southwest portions have light to moderate MEC and/or MD present. An RI would be required to establish MEC and/or MD density and depths and site boundaries within portions of the L2-L3 Extended Buffer Area (JAAP-001-R-02).

4.1.4.5.3 *Munitions Debris*

A survey was conducted as part of the SI Addendum fieldwork effort, and MD was located on the east side of the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS, as indicated by yellow circles on **Map 4-2**.

4.1.4.5.4 *Associated Munitions Constituents*

As agreed upon by regulators and stakeholders during TPOP Meeting 2, environmental media sampling was not conducted. Previous analytical data from the 2004 ROD indicate that chemical constituents are not a concern in the area of the MRS. The need for further characterization will be discussed in a subsequent RI.

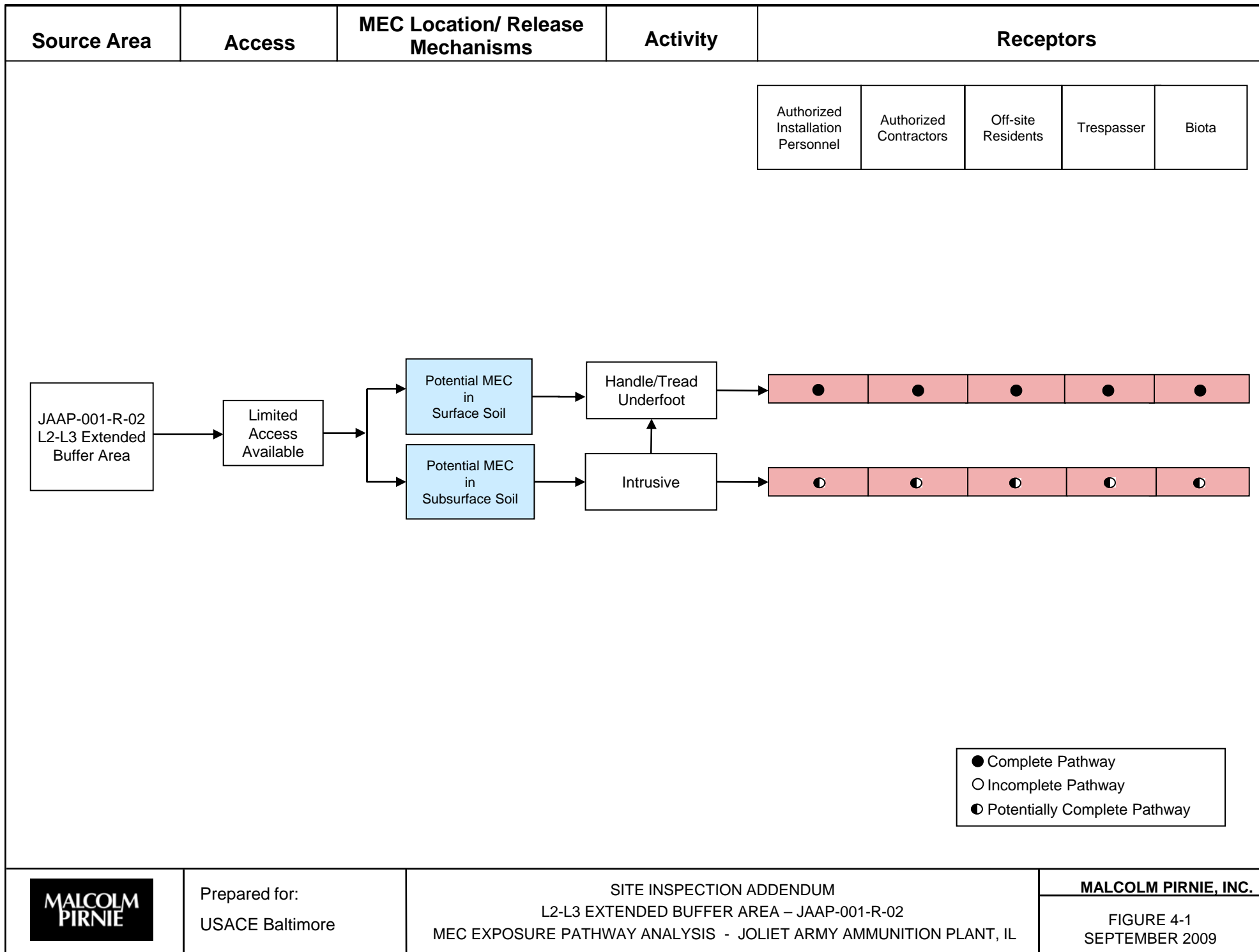
4.1.4.5.5 *Transport Mechanisms / Migration Routes*

Soil disturbance is the primary transport mechanism identified for the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS. The current degree of disturbance at the site is high in the agricultural portions of the parcel and is low in the undeveloped wooded areas.

4.1.4.6 *Pathway Analysis*

4.1.4.6.1 *Munitions and Explosives of Concern*

Based on the findings of the SI Addendum fieldwork and 2007 RA, the potential exists for MEC to be present on the ground surface at the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS. Therefore, the MEC surface and subsurface pathways are potentially complete for all receptors. The MEC Exposure Pathway Analysis is provided as **Figure 4-1**.



4.1.4.6.2 *Munitions Constituents*

MC data were not collected for this SI Addendum based on stakeholder decisions made at TPP Meeting 2 on 15 October 2008. Therefore, an MC Exposure Pathway Analysis could not be created for this MRS at this time.

4.1.5 Site Summary and Conclusions

4.1.5.1 *Munitions and Explosives of Concern*

The SI Addendum and USACE surveys located MEC and MD evidence in the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS. This evidence indicates that a percentage of the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS to the east and southeast has moderate to heavy MEC and/or MD present and the south and southwest portions have light to moderate MEC and/or MD present.

4.1.5.2 *Munitions Constituents*

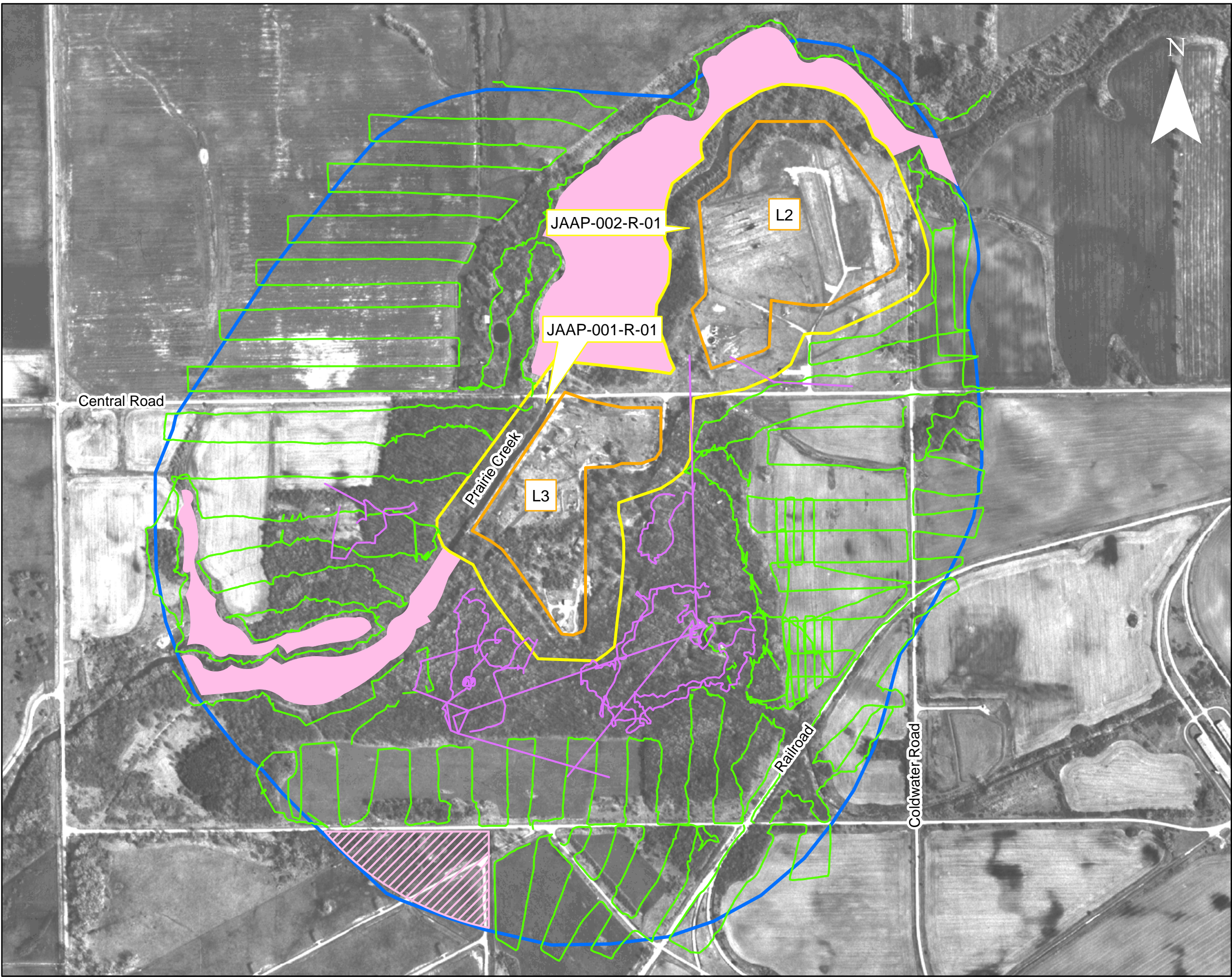
As agreed upon by the IEPA, USEPA, and stakeholders during TPP Meeting 2 on 15 October 2008, environmental media samples were not collected as part of the SI Addendum. Please refer to Appendix D for the TPP meeting minutes. It was determined that the site has been characterized sufficiently in previous sampling efforts, and the 2004 ROD granted an NFA determination for soils. Per discussion at the TPP Meeting 2 and input from the IEPA, future MC investigation in the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS is dependent upon the presence of MEC in the area. Given the MEC and MD discoveries during the SI Addendum field activities, MC will be further evaluated in a future RI.

4.1.6 Site Recommendations

The findings of the MEC SI Addendum field activities and USACE surveys (2007) indicate MEC and MD are present in the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS. It is recommended the HRR Addendum-proposed MRS land area be reduced from 396 acres to 201 acres to exclude areas where MEC and MD were not discovered. Inaccessible areas adjacent to

areas with potential MEC/MD anomalies detected are included in the proposed MRS boundary. Every attempt should be made in the next phase of the MMRP to access these areas for investigation; however, some areas may remain inaccessible due to terrain. Inaccessible areas where no visual observations of MEC/MD were located have been excluded from the proposed MRS boundary.

Map 4-4 presents a recommended MRS boundary for a future RI to fully assess the site.



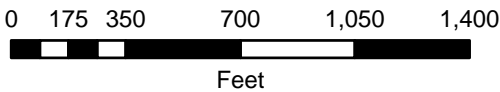
**Site Inspection Addendum
Joliet AAP, IL**



**FINAL
Map 4-1
Survey Transects and Inaccessible Areas**

Legend

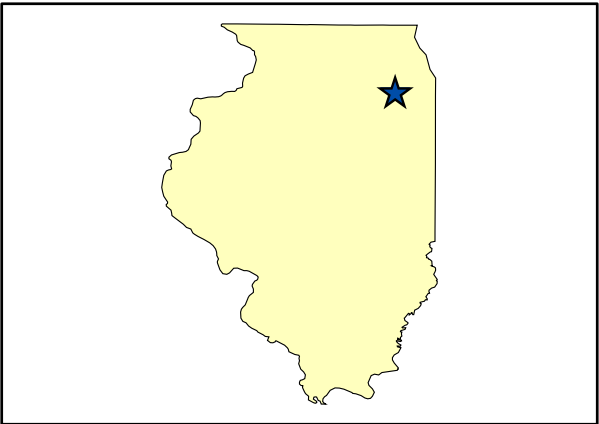
- Previous Survey (Summer 2007)
- Survey Transect (March 2009)
- 200-Foot Buffer Area MRSs
- L2 and L3 - IRP
- L2-L3 Extended Buffer Area
- Inaccessible During 2009 Survey
 - Locked Gate
 - Terrain



Data Source: TerraServer 1M DOQQ

Coordinate System: UTM Zone 16
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final
Date: September 2009



Site Inspection Addendum
Joliet AAP, IL



FINAL
Map 4-2
Points of Interest

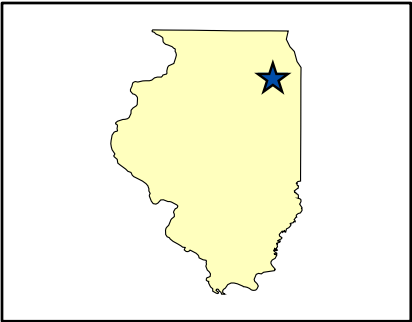
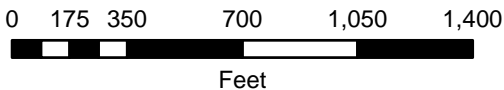
Legend

- MD - Found by USACE
- MEC - Found by USACE
- MD - Found by Pirnie
- Unidentified Metallic Object
- Former Foundation
- Junk Pile
- Previous Survey (Summer 2007)
- Survey Transect (March 2008)
- 200-Foot Buffer Area MRSs
- L2 and L3 - IRP
- L2-L3 Extended Buffer Area
- Inaccessible During 2009 Survey
- Locked Gate
- Terrain

Data Source: TerraServer 1M DOQQ

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Site Inspection Addendum
Joliet AAP, IL

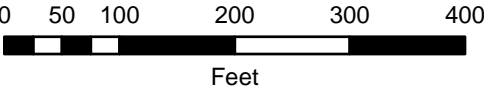


FINAL

Map 4-3
50-Foot Transects in
Agricultural Field

Legend

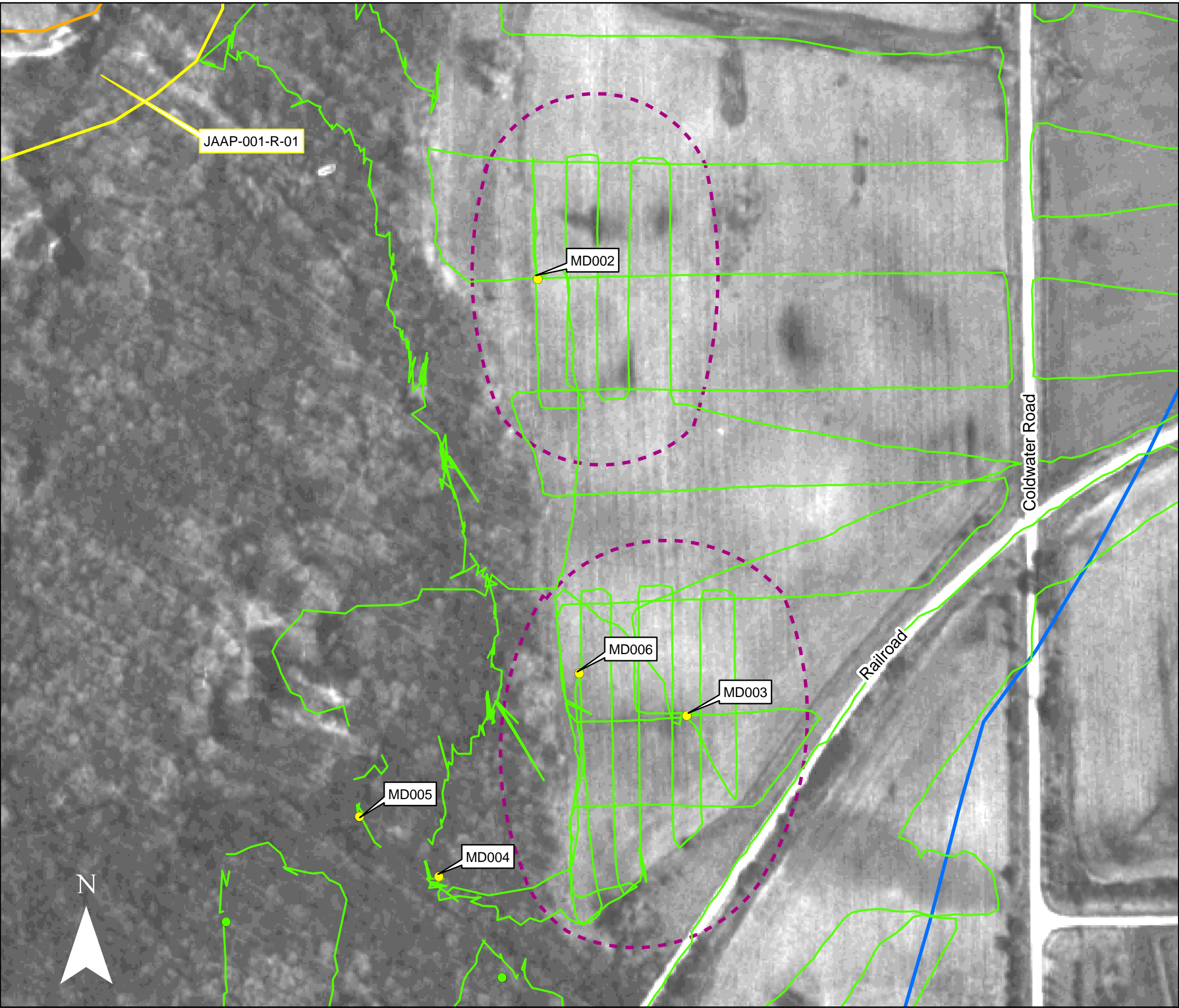
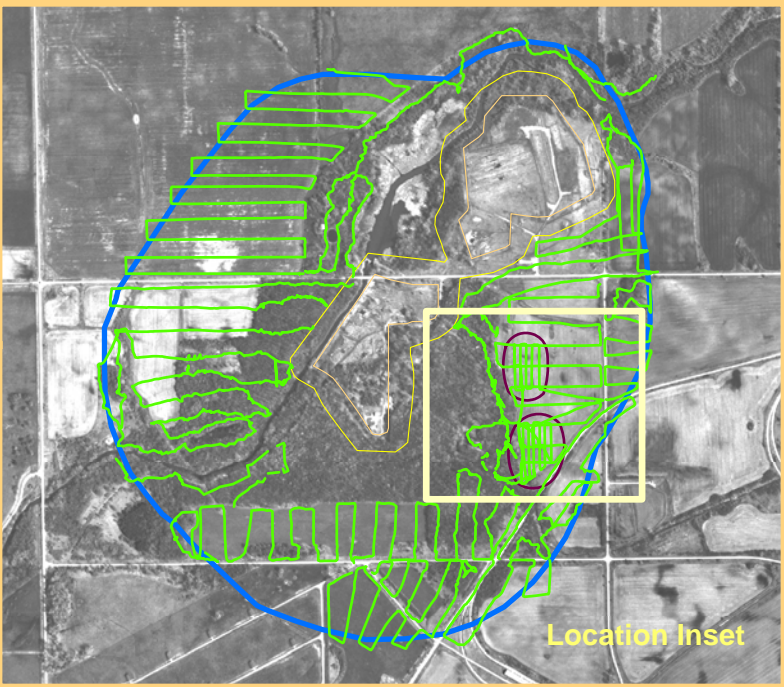
- Unidentified Metallic Object
- MD
- Survey Transect
- 50-Foot Transect Area
- 200-Foot Buffer Area
- L2 and L3 - IRP
- Extended Buffer Area



Data Source: TerraServer 1M DOQQ

Coordinate System: UTM Zone 16
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final
Date: September 2009



Site Inspection Addendum
Joliet AAP, IL



MALCOLM
PIRNIE

FINAL
Map 4-4
Proposed MRS Boundary

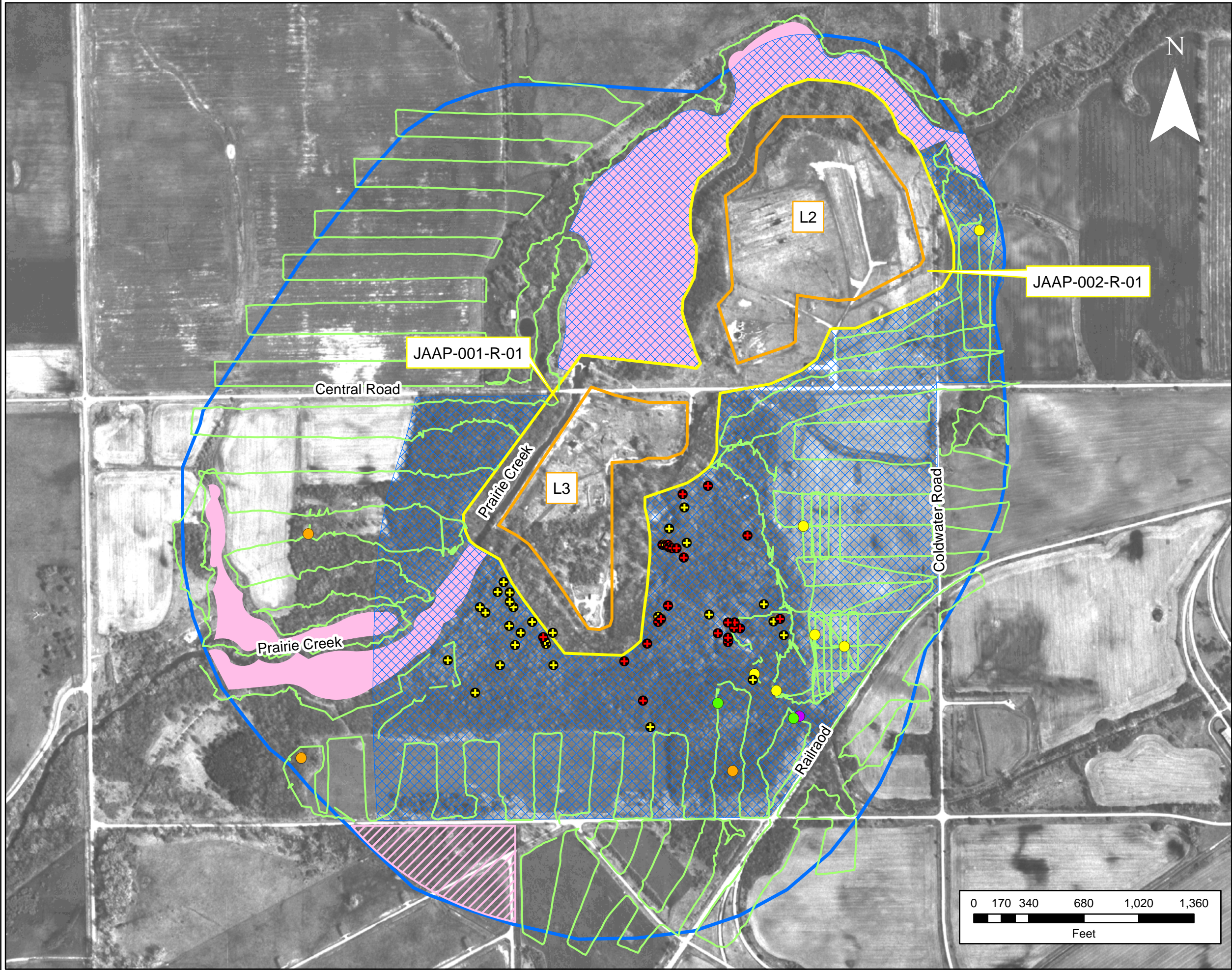
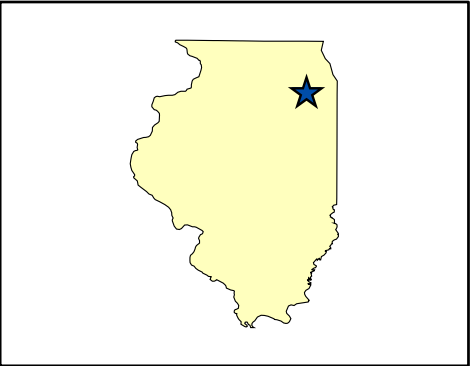
Legend

- MD - Found by USACE
- MEC - Found by USACE
- MD - Found by Pirnie
- Unidentified Metallic Object
- Former Foundation
- Junk Pile
- 200-Foot Buffer Area MRSs
- Proposed MRS Boundary
- L2 and L3 - IRP
- L2-L3 Extended Buffer Area
- Inaccessible During 2009 Survey
- Locked Gate
- Terrain

Data Source: TerraServer 1M DOQQ

Coordinate System: UTM Zone 16
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final
Date: September 2009



5. RECOMMENDATIONS REVIEW

5.1 SUMMARY OF SITE INSPECTION RECOMMENDATIONS

During the HRR Addendum, 396 acres were designated for a new MRS based on research conducted. A geophysical instrument-assisted visual survey was conducted on approximately 30 acres to determine the presence of MEC on the ground surface. Since no visual observations of anomalies were made in large extents of the MRS, it is recommended that the MRS be reduced to 201 acres, to exclude these areas. Areas within the MRS that were not accessible in the SI Addendum, will be studied further during future MMRP phases. The recommendation for the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS at JOAAP is presented in **Table 5-1**. It is based on the results of the research conducted for the HRR, the TPP session held on 15 October 2008, the data collected during the SI Addendum field activities, and the conclusions presented in Section 4 of this report.

Table 5-1: Summary of Recommendations

MRS Size	SI Recommendation	Basis for Recommendation
L2-L3 Extended Buffer Area (JAAP-001-R-02)		
201 acres	RI	MEC and MD were found at the MRS.

5.2 RATIONALE FOR FINAL ACREAGE

The final site acreage is presented in **Table 5-2**.

Table 5-2: Final Acreage Rationale

MRS	AEDB-R ID *	CTT Range/Site Inventory Acreage	2008 HRR Addendum Acreage	2009 SI Addendum Acreage	Rationale for Change
L2-L3 Extended Buffer Area	JAAP-001-R-02	0	396	201	MEC and MD were located on the surface in the L2-L3 Extended Buffer Area. The MRS footprint was reduced to exclude areas where no MEC or MD was located. Inaccessible areas adjacent to areas with potential MEC/MD anomalies detected are included in the proposed MRS boundary.

*AEDB-R ID = Army Environmental Database-Restoration Identification Number

6. REFERENCES

- e²M. 2005. *Final Site Inspection Report, Military Munitions Response Program, Site Inspection Munitions Response Sites.*
- Dames and Moore, Inc. 1994. *Final Phase 2 Remedial Investigation, Load-Assemble-Package Area, Joliet Army Ammunition Plant, Volume 1.*
- IDcide – Local Information Data Server. 2009. <http://www.idcide.com/weather/il/joliet.htm>.
- Malcolm Pirnie, Inc. 2008. *Final Historical Records Review Addendum, Joliet Army Ammunition Plant, Wilmington, Illinois.*
- , 2009. *Final Site Inspection Addendum Work Plan, Joliet Army Ammunition Plant, Wilmington, Illinois.*
- MKM Engineers, Inc. 2008. *Draft Semi-Annual Report for the Groundwater Operable Unit—Long-Term Monitoring Report, Spring Sampling Event 2006, Joliet Army Ammunition Plant.*
- United States Army Corps of Engineers. 2005. *Historical Records Review for Other Than Operational Ranges at JOAAP.*
- United States Department of the Army. 1978. *Installation Assessment of the Joliet Army Ammunition Plant.*
- , 1998. *Record of Decision for the Soil and Groundwater Operable Units on the Manufacturing and Load-Assemble-Package Areas, National Priorities List Sites.*
- , 2002. *Final U.S. Army Closed, Transferring, and Transferred Range/Site Inventory for Joliet Army Ammunition Plant, Illinois.*

Appendix A: Field Notes

Field Logbook Notes
Daily Quality Control Reports
Safety Tailgate Form

Location _____ Date _____

Project / Client _____

Location JOAAPDate 3/2/09 65

Project / Client _____

Weather: 20°, light breeze, sunny

3:15 Arrived at JOAAP office (Greg & Catherine)

Discussed plans for day with Art.

- plan to start in NW quadrant & move to NE quadrant.

Art gave a key to gate.

Have to be out of landfill gate by 4:30

- Art will see if he can get key or arrange for later gate closure.

Art drove to site with us.

4:00 set up to start walking

9:40 Started walking transects. (NW Quad)

Found 3 ~~types~~ of metallic objects - 2 subsurface along the fence line. One on surface was scrap metal - prob from fence.

In field 2 other subsurface met. objects. One along side fence line.

11:45 Completed transects in open field of NW quadrant. No unusual features seen.

Next, walked on other side of fence on west side of L2. Were hindered from walking up to border of 200' buffer by swamp & Prairie Creek. Area immediately west of L2 was inaccessible due to surface water.

Moved to ~~west~~^{east} of L2 & walked transects to

Corner areas remaining around L2.
Encountered one anomaly that is potential MD.

- Located at 4580108.88 m N
408425.99 m E

It was frozen into ground. Approximately 3-4" across. Height unknown (in ground). Brown with reddish hue.

- Possible that it is a rock - could not distinguish because it was embedded in the ground.

Photographs taken.

Were able to maintain visual of at least 10ft on all transects, except where noted below. Greg tested the metal detector on metal every ~3-5 minutes.

No unusual pits/craters/mounds encountered.

Forest Service came on site ~3:00 to find out what we were doing.
Wrapped up at 3:30 & drove rest of site to make plans for the rest of the week.

4:00 Debrief with Art & Mark.
Discussed paths, ground covered & plans for following day.

Did have some hits with detector, but usually near a fence line & all but 2 subsurface.

1 surface - obviously fence metal debris.

2nd surface - wire

Nowhere areas with multiple hits. Scattered & all small - likely scrap or high-iron content rocks.

~~3/1/09~~

10-foot transects not maintained completely in areas immediately west & north of L2. Thick brush. NE of L2 also.

Location Joliet AAPDate 3/3/09

Project / Client _____

Sunny, still/no wind, 20's

Began visual survey at 8:40. Started south of Doyle Road / west of Prairie Creek.

- Several subsurface hits in area ~~just~~ west of L3 about 1/2-way / a little more than 1/2-way down L3. This area is wooded. Were not able to identify any hits - all subsurface. # of hits dropped sharply 1/2-way out of woods.
- Unable to walk part of this area - frozen swamp/pond, small creek, & Prairie Creek
- Worked area south of road below L3. Magazine area, located on western side of this piece was behind a locked fence - unable to access. Almost zero metal contacts in the rest of this area. No surface anomalies.
- Worked area west of old RR line on east side of L3, & area east of road that is east of L3. Almost zero hits. None surface.
- Part of this area swampy, or thick brush - unable to cover some of this area but worked around it.

Location _____

Date 3/3/09

Project / Client _____

- Found some old foundations & piping in wood west of L3 & in area south of road below L3 (also in the woods)

- Able to maintain 10-foot visual, except noted.
- Greg tested the metal detector every ~5 min

Photographed foundations west of L3, & woods south of L3.

Plan to start in fields east of L3 tomorrow.

10-foot transect not maintained for small area near RR bed SE of L3.

8:30 Arrived at Site.

First went to check potential MD found 3/2 ~~1750~~. Confirmed it is $\sim 1/3$ base plate off 155. Took pictures - #1750, 1751, 1752, 1753, 1754, 1755, 1756, ~~1757, 1758~~

Logged item - MD001

Next went to field east of L3. Logged MD002 & MD003. Photographed. MD002 & MD003 were found near western edge of agricultural field.

MD004 in woods.

Cleared entire field & then ran transect back through the woods. Found several contacts, but all were subsurface. Marked subsurface contacts. Will return to get further coverage to better delineate where contacts are no longer made.

Went to field south of L3. Found some metal wire associated with electric lines. No other contacts in the field.

In wooded area west of field, made some contacts but also found old foundations & junk. Contacts were likely associated with this but were @ subsurface so unable to determine.

Went into woods south of L3 but did not make contacts.

In wood SE of L3 -

- right by the creek, there was a lot of trash, - glass, metal cans, miscellaneous.
- one contact subsurface here - likely trash.
- Anomaly 002 found in middle of junk pile. Funnel shape - unable to confirm MD.
- Anomaly 001 found SW of junk pile - tube-shaped object with grooves. Unable to confirm MD.

1:30 Call from MW+H - Mark - looking for us to clear areas marked for well installation. Stopped running transects & went to assist Mark.

Maintained 10-foot transects except for brushy area SW of L3.

Location Joliet AAP

Date 3/5/09

73

Project / Client _____

Weather: 60s, mod to high wind, clear, sunny.

Arrived at site at 7:45 am.

Went to field east of L3. Re-located MD002 & MD003. Walked 150-200 ft on all sides of both MD fields, & 50-foot transects in between. Found grape shot (MD005). No other MEC/MD found but marked subsurface contacts. Extended walk out by 50-foot transects until no contacts were made for 100 feet.

Moved to edge of forest east of L3.

Relocated MD004 & meandered through woods. Found MD006 (root shoulder) ~150 ft NW of MD004. No other MD or MEC found. Marked all subsurface contacts.

Walked through cemetery & meandered woods.

Moved to area SW of L3. Very thick brush for outer 1/2 of area working in from blue line. No MD/MEC.

Marked subsurface contacts. Difficult to walk - went where possible.

Location Joliet AAP Date 3/5/09

Project / Client _____

10-foot transects maintained except in area SW of L3. Thick brush limited visibility & sweep distance of metal detector.

10:45 Left site. Debriefed Art Holz on ~~area~~ finds in SI field activities.

See MEC Anomaly forms for details on MD found.

Location _____ Date _____

Project / Client _____

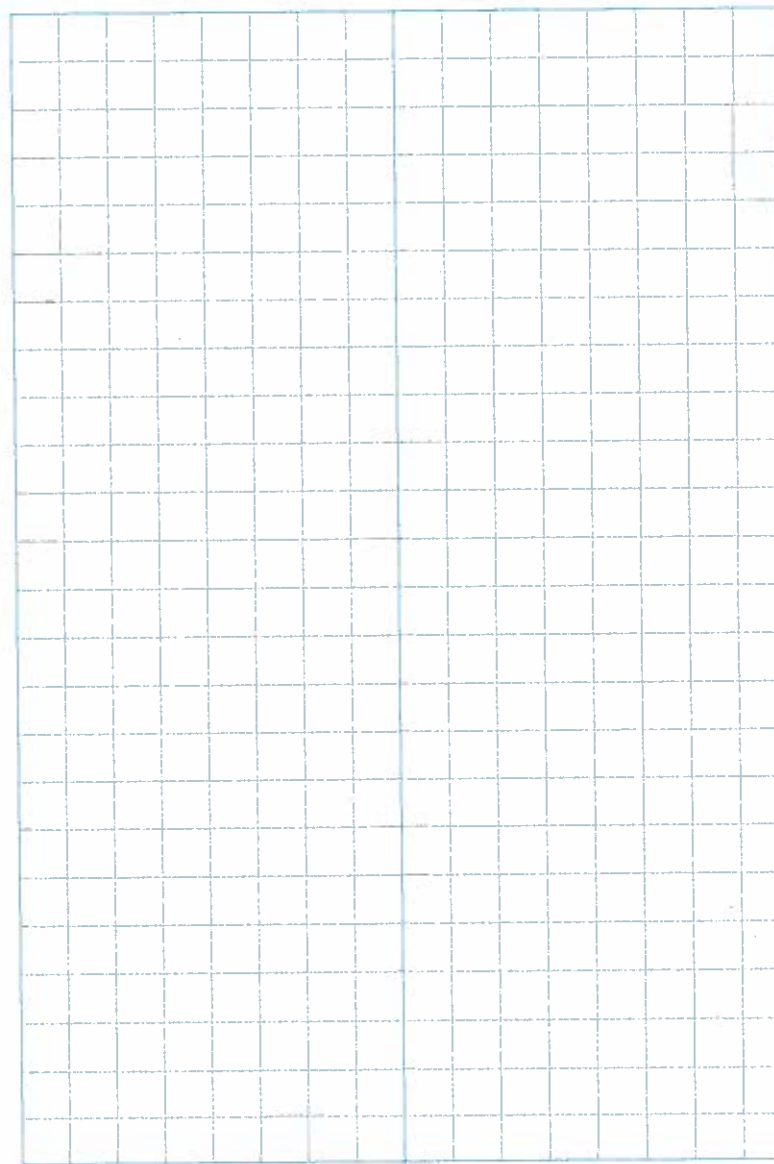


FIGURE 10-1

DATE 3/2/09

MMRP: (Installation name)
DAILY QUALITY CONTROL REPORT

USACE PROJECT MGR. Travis McCann

PROJECT 2118-145 Joliet AAP

JOB NO. _____

CONTRACT NO. _____

DAY	S	<u>M</u>	T	W	TH	F	S
-----	---	----------	---	---	----	---	---

WEATHER	BRIGHT SUN <u>some clouds</u>	CLEAR	OVERCAST	RAIN	SNOW <u>Light</u>
TEMPERATURE	<u>< 32</u>	32 - 50	50 - 70	70-85	>85
WIND	STILL	<u>MODERATE</u>	HIGH	REPORT NO.	
HUMIDITY	<u>DRY</u>	MODERATE	HUMID		

SUBCONTRACTORS ON-SITE: none

EQUIPMENT ON SITE: All-metals hand held detector, Trimble GeoXH Handheld GPS

WORK PERFORMED (INCLUDING SAMPLING): Visual survey / instrument-assisted ~~map~~ of land surface for MEC / MD / surface features. Survey land beyond 200-ft buffer of L2/L3

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):
Metal detector tested on metal ~~rocks~~ every 3-5 minutes
Paths taken were tracked with handheld GPS unit.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:
Safety tailgate at the beginning of the day, warm clothing

PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN:
No problems.

SPECIAL NOTES:
Found only 1 anomaly that could be frag. It was frozen in the ground & could not tell if it was a rock or frag. If frag, likely piece of A-155.

TOMORROW'S EXPECTATIONS:
Begin work in the open field south of Doyle Rd. Clear areas west of Prairie Creek. Then move to work in areas east of the road that is east of L2/L3. Work in from there.

BY Catherine Kelly TITLE Field Project Mgr

FIGURE 10-1

MMRP: (Installation name) DAILY QUALITY CONTROL REPORT		DATE <u>3/3/09</u>									
		DAY <table border="1"><tr><td>S</td><td>M</td><td><u>T</u></td><td>W</td><td>TH</td><td>F</td><td>S</td></tr></table>	S	M	<u>T</u>	W	TH	F	S		
S	M	<u>T</u>	W	TH	F	S					
USACE PROJECT MGR. <u>Travis McCoun</u>	WEATHER	<table border="1"><tr><td><u>BRIGHT SUN</u></td><td>CLEAR</td><td>OVERCAST</td><td>RAIN</td><td>SNOW</td></tr></table>	<u>BRIGHT SUN</u>	CLEAR	OVERCAST	RAIN	SNOW				
<u>BRIGHT SUN</u>	CLEAR	OVERCAST	RAIN	SNOW							
PROJECT <u>Joliet AAP</u>	TEMPERATURE	<table border="1"><tr><td><u>< 32</u></td><td>32 - 50</td><td>50 - 70</td><td>70-85</td><td>>85</td></tr></table>	<u>< 32</u>	32 - 50	50 - 70	70-85	>85				
<u>< 32</u>	32 - 50	50 - 70	70-85	>85							
JOB NO. <u>2118-145</u>	WIND	<table border="1"><tr><td><u>STILL</u></td><td>MODERATE</td><td>HIGH</td><td colspan="2" rowspan="2">REPORT NO.</td></tr><tr><td>HUMIDITY</td><td><u>DRY</u></td><td>MODERATE</td><td>HUMID</td></tr></table>	<u>STILL</u>	MODERATE	HIGH	REPORT NO.		HUMIDITY	<u>DRY</u>	MODERATE	HUMID
<u>STILL</u>	MODERATE	HIGH	REPORT NO.								
HUMIDITY	<u>DRY</u>	MODERATE			HUMID						
CONTRACT NO. _____											

SUBCONTRACTORS ON-SITE: <u>none</u>
EQUIPMENT ON SITE: <u>Hand held all metals detector, Hand held GPS unit</u>
WORK PERFORMED (INCLUDING SAMPLING): <u>Instrument-assisted visual survey South of Doyle Road & West of Prairie creek, South of road below L3, & east of road east of L2/L3.</u>
QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS): <u>Calibrated metal detector ~every 5 minutes</u>
HEALTH AND SAFETY LEVELS AND ACTIVITIES: <u>Safety tailgate, warm clothing</u>
PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN:
SPECIAL NOTES:
TOMORROW'S EXPECTATIONS: <u>Begin west of road that lies east of L3. Clear that field & then move south of L3. Will be working with another contractor on site to clear an area for well installation</u>

BY Catherine Kelly TITLE Field Project Mgr

FIGURE 10-1

MMRP: (Installation name) DAILY QUALITY CONTROL REPORT		DATE <u>3/4/09</u>																															
USACE PROJECT MGR. <u>Travis McComm</u> PROJECT <u>Joliet AAP SI Addendum</u> JOB NO. _____ CONTRACT NO. _____		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DAY</td> <td>S</td> <td>M</td> <td>T</td> <td><u>W</u></td> <td>TH</td> <td>F</td> <td>S</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>WEATHER</td> <td><u>BRIGHT SUN</u></td> <td>CLEAR</td> <td>OVERCAST</td> <td>RAIN</td> <td>SNOW</td> </tr> <tr> <td>TEMPERATURE</td> <td>< 32</td> <td><u>32 - 50</u></td> <td>50 - 70</td> <td>70-85</td> <td>>85</td> </tr> <tr> <td>WIND</td> <td>STILL</td> <td><u>MODERATE</u></td> <td>HIGH</td> <td colspan="2" rowspan="2">REPORT NO.</td> </tr> <tr> <td>HUMIDITY</td> <td><u>DRY</u></td> <td>MODERATE</td> <td>HUMID</td> </tr> </table>		DAY	S	M	T	<u>W</u>	TH	F	S	WEATHER	<u>BRIGHT SUN</u>	CLEAR	OVERCAST	RAIN	SNOW	TEMPERATURE	< 32	<u>32 - 50</u>	50 - 70	70-85	>85	WIND	STILL	<u>MODERATE</u>	HIGH	REPORT NO.		HUMIDITY	<u>DRY</u>	MODERATE	HUMID
DAY	S	M	T	<u>W</u>	TH	F	S																										
WEATHER	<u>BRIGHT SUN</u>	CLEAR	OVERCAST	RAIN	SNOW																												
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WIND	STILL	<u>MODERATE</u>	HIGH	REPORT NO.																													
HUMIDITY	<u>DRY</u>	MODERATE	HUMID																														
SUBCONTRACTORS ON-SITE:																																	
EQUIPMENT ON SITE: <u>Hand held all-metal detector, Trimble Handheld GPS unit</u>																																	
WORK PERFORMED (INCLUDING SAMPLING): <u>Visual instrument-assisted survey of land surface. Worked areas S, SW, E of L3. Cleared 2 areas for well installation.</u>																																	
QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS): <u>Tested/calibrated metal detector ~ every 5 minutes</u>																																	
HEALTH AND SAFETY LEVELS AND ACTIVITIES: <u>Safety tailgate.</u>																																	
PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN: <u>None</u>																																	
SPECIAL NOTES: <u>Met Mark from MWH (Sub for TolTest) to clear 2 areas near Prairie Creek for well installation.</u>																																	
TOMORROW'S EXPECTATIONS: <u>One small area SW of L3 remains to be cleared. Will cover more of the area East of L3 to better delineate presence of MEC/MD. Out brief for completion of SI field activities</u>																																	
BY <u>Catherine Kelly</u>		TITLE <u>Field Project Mgr</u>																															

FIGURE 10-1

MMRP: (Installation name)
DAILY QUALITY CONTROL REPORT

USACE PROJECT MGR. Travis McCoun

PROJECT Joliet AAP

JOB NO. 2118-145

CONTRACT NO. _____

DATE 3/5/09

DAY

S	M	T	W	TH	F	S
---	---	---	---	----	---	---

WEATHER

BRIGHT SUN	CLEAR	OVERCAST	RAIN	SNOW
------------	-------	----------	------	------

TEMPERATURE

< 32	32 - 50	50 - 70	70-85	>85
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WIND

STILL	MODERATE	HIGH	REPORT NO.	
-------	----------	------	------------	--

HUMIDITY

DRY	MODERATE	HUMID		
-----	----------	-------	--	--

SUBCONTRACTORS ON-SITE:	
EQUIPMENT ON SITE:	
<u>All metals hand-held detector, Trimble Geo XT GPS handheld unit</u>	
WORK PERFORMED (INCLUDING SAMPLING):	
<u>Walked 50 ft transects in field east of L3. Walked woods off east side of L3 to SW of L3.</u>	
QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):	
<u>Metal detector checked ~ every 5 minutes</u>	
HEALTH AND SAFETY LEVELS AND ACTIVITIES:	
<u>Safety tailgate.</u>	
PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN:	
<u>none</u>	
SPECIAL NOTES:	
<u>Completed field activities. Debriefed Art Hole on finds. No MEC located. 6 surface MD items found & logged.</u>	
TOMORROW'S EXPECTATIONS:	

BY Catherine Kelly TITLE Field Project Mgr

SITE SAFETY TAILGATE MEETING

**MALCOLM
PIRNIE**

PROJECT NAME:	Joliet Army Ammunition Plant	CLIENT NAME:	USACE—Baltimore
PROJECT NUMBER:	2118-145	PROJECT LEADER:	Courtney Ingersoll
PREPARED BY:	Catherine Kelly	DATE:	3/2/09 — 3/5/09
ON-SITE SAFETY MEETING RECORD			
LOCATION: JOAAP, Illinois			
Task to be Performed: Instrument-assisted visual survey			
I. Purpose for meeting: (check all that apply)			
<input checked="" type="checkbox"/>	DAILY SAFETY BRIEFING		
<input checked="" type="checkbox"/>	Begin New Task. Task: Magnetometer-assisted site survey		
<input type="checkbox"/>	Periodic Safety Meeting		
<input checked="" type="checkbox"/>	New Site Procedures		
<input checked="" type="checkbox"/>	New Site Conditions / Information		
<input checked="" type="checkbox"/>	New Site Workers		
MEETING ATTENDEES			
NAME (Print)		SIGNATURE	COMPANY
1.	Catherine Kelly	Catherine Kelly	MP1
2.	GREG PETERSON	[Signature]	MP1
3.			
4.			
5.			

<div style="text-align: right;">Page 2 of 2</div> ON-SITE SAFETY MEETING RECORD			
II. Topic (check all that apply)			
<input checked="" type="checkbox"/>	Site Safety Personnel		Decontamination
<input checked="" type="checkbox"/>	Work Area Description	<input checked="" type="checkbox"/>	Emergency Response
<input checked="" type="checkbox"/>	Site characterization	<input checked="" type="checkbox"/>	Hazard Communication
<input checked="" type="checkbox"/>	Equipment Hazard(s)	<input checked="" type="checkbox"/>	On-site Emergency
<input checked="" type="checkbox"/>	Biological Hazard(s)	<input checked="" type="checkbox"/>	On-site Injuries
	Chemical Hazard(s)	<input checked="" type="checkbox"/>	Evacuation Procedures
<input checked="" type="checkbox"/>	Physical Hazard(s)	<input checked="" type="checkbox"/>	Rally Point
	Heat Stress	<input checked="" type="checkbox"/>	Emergency Communications
<input checked="" type="checkbox"/>	Cold Stress	<input checked="" type="checkbox"/>	Directions to Hospital
<input checked="" type="checkbox"/>	Site Control		Emergency Equipment
	Work and Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Air Monitoring		Task Training
<input checked="" type="checkbox"/>	Safe Work Practices	<input checked="" type="checkbox"/>	Unexploded Ordnance (UXO)
III. Remarks			
BRIF GIVEN EACH DAY BEFORE START OF SURFACE SWEEP OPERATIONS. <i>[Signature]</i>			

V. Verification

I certify that the personnel listed on this roster received the briefing described above. Site personnel not attending this meeting will be briefed before beginning their assigned duties.

Catherine Kelly 3/2/09
Field Project Manager Date

[Signature] 3/2/09
UXO Health and Safety Supervisor Date

Appendix B: Field Forms and Photographic Log

Munitions and Explosives of Concern/Multiple Anomaly Discovery Forms
Photographic Log



MEC/MULTIPLE ANOMALY DISCOVERY FORM

Installation: Joliet Army Ammunition Plant
UXO Team Leader Supervisor: Greg Peterson

Site: L2-L3 Extended Buffer Area

Grid: N/A
Date: 03/02/09

Anomaly ID No. (i.e. FAR A-001)	MD001		
Anomaly Longitude X/Latitude Y (UTM)	4580108.833	408426.057	
Object length			
Object Diameter/Thickness	5"/2.5"		
Object Weight (Estimated)	unknown		
Slope of terrain (Check one box)	<input type="checkbox"/> <10° <input checked="" type="checkbox"/> 10° to 30° <input type="checkbox"/> >30		
Vegetation cover (Check one box)	<input type="checkbox"/> Clear <input checked="" type="checkbox"/> Vegetation <input type="checkbox"/> Swamp		
Soil type (Check one box)	<input type="checkbox"/> Sand <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Rock		
Inclination	<input type="checkbox"/> 0° <input type="checkbox"/> 45° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 135° <input type="checkbox"/> 180°		
Orientation	<input type="checkbox"/> N <input type="checkbox"/> NW-S <input type="checkbox"/> E-W <input type="checkbox"/> SW-NE		

Item Description/Justification/Comments

1/3 of the base portion from a 155-mm projectile

Anomaly type categories (Select Appropriate Box)

☐ UXO ☐ DMM ☒ Munitions Debris ☐ Practice Ordnance
☐ Inert Ordnance ☐ Other ☐ Metal Waste

Was photo taken? ☒ Yes ☐ No File Name: JOAAP-05, JOAAP-06

Ordnance Positive Identification (If known, record below and note fuze condition)

Quantity: 1	Ordnance Item: portion of a 155-projectile base Mark/Mod:	Nose Fuze: n/a Mark/Mod:	Tail Fuze: n/a Mark/Mod:
-------------	--	-----------------------------	-----------------------------

Ordnance Filler: ☐ Explosive ☐ Propellant ☐ Pyrotechnic ☐ Other N.E.W.: n/a

Ordnance Category:

☐ Bombs ☐ Grenades ☐ Guided Missiles ☐ Clusters/Dispensers
☐ Land Mines ☐ Mortars ☒ Projectiles ☐ Misc. Explosive Devices
☐ Rockets ☐ Small Arms ☐ Underwater Ordnance ☐ Pyrotechnics and Flares

Fuzing Types

☐ Piezo-Electric ☐ Proximity (VT) ☐ Impact ☐ Base Detonating ☐ All-ways Acting ☐ Electric
☐ Influence ☐ Mech long delay ☐ Mechanical Time ☐ MT Superquick ☐ Pressure
☐ Powder Train Time Fuze (PTTF) ☐ Point-initiating, Base-detonating ☐ Point Detonating (PD)

Status of MEC/UXO ☐ Armed ☒ Unarmed

Physical Condition ☐ Broken Open ☐ Filler Visible ☐ Soil Staining ☐ Soil Sample Taken ☐ Intact

FOR SUXOS USE

Disposition: (Clarify Under Remarks) ☐ Transport ☒ Leave In Place ☐ Other Date:

Notifications To Installation By: Signature: Date:

Transported By: Signature: Date:

Transferred To: Signature: Date:

Destroyed By: Signature: Date:

Remarks:

Signature:  SUXOS



MEC/MULTIPLE ANOMALY DISCOVERY FORM

Installation: Joliet Army Ammunition Plant
UXO Team Leader Supervisor: Greg Peterson

Site: L2-L3 Extended Buffer Area

Grid: N/A
Date: 03/04/09

Anomaly ID No. (i.e. FAR A-001)		MD002	
Anomaly Longitude X/Latitude Y (UT)		4579551.914	408094.097
Object length			
Object Diameter/Thickness		5"	
Object Weight (Estimated)			
Slope of terrain (Check one box)		<input checked="" type="checkbox"/> <10° <input type="checkbox"/> 10° to 30° <input type="checkbox"/> >30	
Vegetation cover (Check one box)		<input type="checkbox"/> Clear <input checked="" type="checkbox"/> Vegetation <input type="checkbox"/> Swamp	
Soil type (Check one box)		<input type="checkbox"/> Sand <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Rock	
Inclination		<input checked="" type="checkbox"/> 0° <input type="checkbox"/> 45° <input type="checkbox"/> 90° <input type="checkbox"/> 135° <input type="checkbox"/> 180°	
Orientation		<input type="checkbox"/> N <input type="checkbox"/> NW-S <input type="checkbox"/> E-W <input type="checkbox"/> SW-NE	
Item Description/Justification/Comments			
155mm-projectile APERS Ogive			
Anomaly type categories (Select Appropriate Box)			
<input type="checkbox"/> UXO <input type="checkbox"/> DMM <input checked="" type="checkbox"/> Munitions Debris <input type="checkbox"/> Practice Ordnance <input type="checkbox"/> Inert Ordnance <input type="checkbox"/> Other <input type="checkbox"/> Metal Waste			
Was photo taken?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No File Name: JOAAP-09, JOAAP-10	
Ordnance Positive Identification (If known, record below and note fuze condition)			
Quantity: 1	Ordnance Item: Mark/Mod:	Nose Fuze: n/a Mark/Mod:	Tail Fuze: n/a Mark/Mod:
Ordnance Filler:	<input type="checkbox"/> Explosive <input type="checkbox"/> Propellant <input type="checkbox"/> Pyrotechnic <input type="checkbox"/> Other		N.E.W.: n/a
Ordnance Category:			
<input type="checkbox"/> Bombs <input type="checkbox"/> Grenades <input type="checkbox"/> Guided Missiles <input type="checkbox"/> Clusters/Dispensers <input type="checkbox"/> Land Mines <input type="checkbox"/> Mortars <input checked="" type="checkbox"/> Projectiles <input type="checkbox"/> Misc. Explosive Devices <input type="checkbox"/> Rockets <input type="checkbox"/> Small Arms <input type="checkbox"/> Underwater Ordnance <input type="checkbox"/> Pyrotechnics and Flares			
Fuzing Types			
<input type="checkbox"/> Piezo-Electric <input type="checkbox"/> Proximity (VT) <input type="checkbox"/> Impact <input type="checkbox"/> Base Detonating <input type="checkbox"/> All-ways Acting <input type="checkbox"/> Electric <input type="checkbox"/> Influence <input type="checkbox"/> Mech long delay <input type="checkbox"/> Mechanical Time <input type="checkbox"/> MT Superquick <input type="checkbox"/> Pressure <input type="checkbox"/> Powder Train Time Fuze (PTTF) <input type="checkbox"/> Point-initiating, Base-detonating <input type="checkbox"/> Point Detonating (PD)			
Status of MEC/UXO <input type="checkbox"/> Armed <input checked="" type="checkbox"/> Unarmed			
Physical Condition	<input type="checkbox"/> Broken Open <input type="checkbox"/> Filler Visible <input type="checkbox"/> Soil Staining <input type="checkbox"/> Soil Sample Taken <input type="checkbox"/> Intact		
FOR SUXOS USE			
Disposition: (Clarify Under Remarks)		<input type="checkbox"/> Transport <input checked="" type="checkbox"/> Leave In Place <input type="checkbox"/> Other	Date:
Notifications To Installation By:		Signature:	Date:
Transported By:		Signature:	Date:
Transferred To:		Signature:	Date:
Storage Location:			
Destroyed By:		Signature	Date:
Remarks: Signature:  SUXOS			

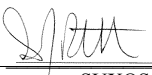


MEC/MULTIPLE ANOMALY DISCOVERY FORM

Installation: Joliet Army Ammunition Plant
UXO Team Leader Supervisor: Greg Peterson

Site: L2-L3 Extended Buffer Area

Grid: N/A
Date: 03/04/09

Anomaly ID No. (i.e. FAR A-001)	MD003		
Anomaly Longitude X/Latitude Y (UTM)	4579325.965	408171.291	
Object length	4"		
Object Diameter/Thickness	1.5"		
Object Weight (Estimated)			
Slope of terrain (Check one box)	<input checked="" type="checkbox"/> <10° <input type="checkbox"/> 10° to 30° <input type="checkbox"/> >30		
Vegetation cover (Check one box)	<input type="checkbox"/> Clear <input checked="" type="checkbox"/> Vegetation <input type="checkbox"/> Swamp		
Soil type (Check one box)	<input type="checkbox"/> Sand <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Rock		
Inclination	<input checked="" type="checkbox"/> 0° <input type="checkbox"/> 45° <input type="checkbox"/> 90° <input type="checkbox"/> 135° <input type="checkbox"/> 180°		
Orientation	<input type="checkbox"/> N <input type="checkbox"/> NW-S <input checked="" type="checkbox"/> E-W <input type="checkbox"/> SW-NE		
Item Description/Justification/Comments			
Not Identifiable – Appears to be the remains of a PD or Impact Projectile fuze			
Anomaly type categories (Select Appropriate Box)			
<input type="checkbox"/> UXO <input type="checkbox"/> DMM <input checked="" type="checkbox"/> Munitions Debris <input type="checkbox"/> Practice Ordnance			
<input type="checkbox"/> Inert Ordnance <input type="checkbox"/> Other <input type="checkbox"/> Metal Waste			
Was photo taken?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	File Name: JOAAP-11, JOAAP-12	
Ordnance Positive Identification (If known, record below and note fuze condition)			
Quantity: 1	Ordnance Item: Mark/Mod:	Nose Fuze: n/a Mark/Mod:	Tail Fuze: n/a Mark/Mod:
Ordnance Filler:	<input type="checkbox"/> Explosive <input type="checkbox"/> Propellant <input type="checkbox"/> Pyrotechnic <input type="checkbox"/> Other	N.E.W.: n/a	
Ordnance Category:			
<input type="checkbox"/> Bombs <input type="checkbox"/> Grenades <input type="checkbox"/> Guided Missiles <input type="checkbox"/> Clusters/Dispensers			
<input type="checkbox"/> Land Mines <input type="checkbox"/> Mortars <input type="checkbox"/> Projectiles <input type="checkbox"/> Misc. Explosive Devices			
<input type="checkbox"/> Rockets <input type="checkbox"/> Small Arms <input type="checkbox"/> Underwater Ordnance <input type="checkbox"/> Pyrotechnics and Flares			
Fuzing Types			
<input type="checkbox"/> Piezo-Electric <input type="checkbox"/> Proximity (VT) <input checked="" type="checkbox"/> Impact <input type="checkbox"/> Base Detonating <input type="checkbox"/> All-ways Acting <input type="checkbox"/> Electric			
<input type="checkbox"/> Influence <input type="checkbox"/> Mech long delay <input type="checkbox"/> Mechanical Time <input type="checkbox"/> MT Superquick <input type="checkbox"/> Pressure			
<input type="checkbox"/> Powder Train Time Fuze (PTTF) <input type="checkbox"/> Point-initiating, Base-detonating <input checked="" type="checkbox"/> Point Detonating (PD)			
Status of MEC/UXO <input type="checkbox"/> Armed <input checked="" type="checkbox"/> Unarmed			
Physical Condition	<input type="checkbox"/> Broken Open <input type="checkbox"/> Filler Visible <input type="checkbox"/> Soil Staining <input type="checkbox"/> Soil Sample Taken <input type="checkbox"/> Intact		
FOR SUXOS USE			
Disposition: (Clarify Under Remarks)	<input type="checkbox"/> Transport <input checked="" type="checkbox"/> Leave In Place <input type="checkbox"/> Other	Date:	
Notifications To Installation By:	Signature:	Date:	
Transported By:	Signature:	Date:	
Transferred To:	Signature:	Date:	
Destroyed By:	Signature:	Date:	
Remarks: Signature: <u></u> SUXOS			

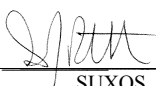


MEC/MULTIPLE ANOMALY DISCOVERY FORM

Installation: Joliet Army Ammunition Plant
UXO Team Leader Supervisor: Greg Peterson

Site: L2-L3 Extended Buffer Area

Grid: N/A
Date: 03/05/09

Anomaly ID No. (i.e. FAR A-001)		MD004			
Anomaly Longitude X/Latitude Y (UTM)		4579242.662		408042.844	
Object length					
Object Diameter/Thickness		5"			
Object Weight (Estimated)					
Slope of terrain (Check one box)		<input type="checkbox"/> <10° <input checked="" type="checkbox"/> 10° to 30° <input type="checkbox"/> >30			
Vegetation cover (Check one box)		<input type="checkbox"/> Clear <input checked="" type="checkbox"/> Vegetation <input type="checkbox"/> Swamp			
Soil type (Check one box)		<input type="checkbox"/> Sand <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Rock			
Inclination		<input type="checkbox"/> 0° <input type="checkbox"/> 45° <input type="checkbox"/> 90° <input type="checkbox"/> 135° <input type="checkbox"/> 180°			
Orientation		<input type="checkbox"/> N <input type="checkbox"/> NW-S <input type="checkbox"/> E-W <input type="checkbox"/> SW-NE			
Item Description/Justification/Comments					
155mm-projectile APERS Ogive					
Anomaly type categories (Select Appropriate Box)					
<input type="checkbox"/> UXO <input type="checkbox"/> DMM <input checked="" type="checkbox"/> Munitions Debris <input type="checkbox"/> Practice Ordnance					
<input type="checkbox"/> Inert Ordnance <input type="checkbox"/> Other <input type="checkbox"/> Metal Waste					
Was photo taken?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		File Name: JOAAP-13, JOAAP-14	
Ordnance Positive Identification (If known, record below and note fuze condition)					
Quantity: 1	Ordnance Item: Mark/Mod:		Nose Fuze: n/a Mark/Mod:		Tail Fuze: n/a Mark/Mod:
Ordnance Filler:	<input type="checkbox"/> Explosive <input type="checkbox"/> Propellant		<input type="checkbox"/> Pyrotechnic <input type="checkbox"/> Other		N.E.W.: n/a
Ordnance Category:					
<input type="checkbox"/> Bombs <input type="checkbox"/> Grenades <input type="checkbox"/> Guided Missiles <input type="checkbox"/> Clusters/Dispensers					
<input type="checkbox"/> Land Mines <input type="checkbox"/> Mortars <input checked="" type="checkbox"/> Projectiles <input type="checkbox"/> Misc. Explosive Devices					
<input type="checkbox"/> Rockets <input type="checkbox"/> Small Arms <input type="checkbox"/> Underwater Ordnance <input type="checkbox"/> Pyrotechnics and Flares					
Fuzing Types					
<input type="checkbox"/> Piezo-Electric <input type="checkbox"/> Proximity (VT) <input type="checkbox"/> Impact <input type="checkbox"/> Base Detonating <input type="checkbox"/> All-ways Acting <input type="checkbox"/> Electric					
<input type="checkbox"/> Influence <input type="checkbox"/> Mech long delay <input type="checkbox"/> Mechanical Time <input type="checkbox"/> MT Superquick <input type="checkbox"/> Pressure					
<input type="checkbox"/> Powder Train Time Fuze (PTTF) <input type="checkbox"/> Point-initiating, Base-detonating <input type="checkbox"/> Point Detonating (PD)					
Status of MEC/UXO					
<input type="checkbox"/> Armed <input checked="" type="checkbox"/> Unarmed					
Physical Condition		<input type="checkbox"/> Broken Open <input type="checkbox"/> Filler Visible		<input type="checkbox"/> Soil Staining <input type="checkbox"/> Soil Sample Taken <input type="checkbox"/> Intact	
FOR SUXOS USE					
Disposition: (Clarify Under Remarks)		<input type="checkbox"/> Transport <input checked="" type="checkbox"/> Leave In Place <input type="checkbox"/> Other		Date:	
Notifications To Installation By:		Signature:		Date:	
Transported By:		Signature:		Date:	
Transferred To:		Signature:		Date:	
Destroyed By:		Signature		Date:	
Remarks: Signature:  SUXOS					

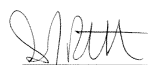


MEC/MULTIPLE ANOMALY DISCOVERY FORM

Installation: Joliet Army Ammunition Plant
UXO Team Leader Supervisor: Greg Peterson

Site: L2-L3 Extended Buffer Area

Grid: N/A
Date: 03/05/09

Anomaly ID No. (i.e. FAR A-001)	MD005		
Anomaly Longitude X/Latitude Y (UTM)	4579347.78	408115.694	
Object length			
Object Diameter/Thickness	0.5"		
Object Weight (Estimated)			
Slope of terrain (Check one box)	<input checked="" type="checkbox"/> <10° <input type="checkbox"/> 10° to 30° <input type="checkbox"/> >30		
Vegetation cover (Check one box)	<input checked="" type="checkbox"/> Clear <input type="checkbox"/> Vegetation <input type="checkbox"/> Swamp		
Soil type (Check one box)	<input type="checkbox"/> Sand <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Rock		
Inclination	<input checked="" type="checkbox"/> 0° <input type="checkbox"/> 45° <input type="checkbox"/> 90° <input type="checkbox"/> 135° <input type="checkbox"/> 180°		
Orientation	<input type="checkbox"/> N <input type="checkbox"/> NW-S <input type="checkbox"/> E-W <input type="checkbox"/> SW-NE		
Item Description/Justification/Comments			
76mm steel shot from canister projectile			
Anomaly type categories (Select Appropriate Box)			
<input type="checkbox"/> UXO <input type="checkbox"/> DMM <input checked="" type="checkbox"/> Munitions Debris <input type="checkbox"/> Practice Ordnance			
<input type="checkbox"/> Inert Ordnance <input type="checkbox"/> Other <input type="checkbox"/> Metal Waste			
Was photo taken?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	File Name: JOAAP-20	
Ordnance Positive Identification (If known, record below and note fuze condition)			
Quantity: 1	Ordnance Item: Mark/Mod:	Nose Fuze: n/a Mark/Mod:	Tail Fuze: n/a Mark/Mod:
Ordnance Filler:	<input type="checkbox"/> Explosive <input type="checkbox"/> Propellant <input type="checkbox"/> Pyrotechnic <input type="checkbox"/> Other	N.E.W.: n/a	
Ordnance Category:			
<input type="checkbox"/> Bombs <input type="checkbox"/> Grenades <input type="checkbox"/> Guided Missiles <input type="checkbox"/> Clusters/Dispensers			
<input type="checkbox"/> Land Mines <input type="checkbox"/> Mortars <input checked="" type="checkbox"/> Projectiles <input type="checkbox"/> Misc. Explosive Devices			
<input type="checkbox"/> Rockets <input type="checkbox"/> Small Arms <input type="checkbox"/> Underwater Ordnance <input type="checkbox"/> Pyrotechnics and Flares			
Fuzing Types			
<input type="checkbox"/> Piezo-Electric <input type="checkbox"/> Proximity (VT) <input type="checkbox"/> Impact <input type="checkbox"/> Base Detonating <input type="checkbox"/> All-ways Acting <input type="checkbox"/> Electric			
<input type="checkbox"/> Influence <input type="checkbox"/> Mech long delay <input type="checkbox"/> Mechanical Time <input type="checkbox"/> MT Superquick <input type="checkbox"/> Pressure			
<input type="checkbox"/> Powder Train Time Fuze (PTTF) <input type="checkbox"/> Point-initiating, Base-detonating <input type="checkbox"/> Point Detonating (PD)			
Status of MEC/UXO			
<input type="checkbox"/> Armed <input checked="" type="checkbox"/> Unarmed			
Physical Condition	<input type="checkbox"/> Broken Open <input type="checkbox"/> Filler Visible <input type="checkbox"/> Soil Staining <input type="checkbox"/> Soil Sample Taken <input type="checkbox"/> Intact		
FOR SUXOS USE			
Disposition: (Clarify Under Remarks)	<input type="checkbox"/> Transport <input checked="" type="checkbox"/> Leave In Place <input type="checkbox"/> Other	Date:	
Notifications To Installation By:	Signature:	Date:	
Transported By:	Signature:	Date:	
Transferred To:	Signature:	Date:	
Destroyed By:	Signature	Date:	
Remarks: Signature:  SUXOS			

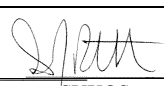


MEC/MULTIPLE ANOMALY DISCOVERY FORM

Installation: Joliet Army Ammunition Plant
UXO Team Leader Supervisor: Greg Peterson

Site: L2-L3 Extended Buffer Area

Grid: N/A
Date: 03/05/09

Anomaly ID No. (i.e. FAR A-001)		MD006	
Anomaly Longitude X/Latitude Y (UT)		4579273.664	408001.705
Object length			
Object Diameter/Thickness		1.5"/1"	
Object Weight (Estimated)			
Slope of terrain (Check one box)		<input type="checkbox"/> <10° <input checked="" type="checkbox"/> 10° to 30° <input type="checkbox"/> >30	
Vegetation cover (Check one box)		<input type="checkbox"/> Clear <input checked="" type="checkbox"/> Vegetation <input type="checkbox"/> Swamp	
Soil type (Check one box)		<input type="checkbox"/> Sand <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Rock	
Inclination		<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 45° <input type="checkbox"/> 90° <input type="checkbox"/> 135° <input type="checkbox"/> 180°	
Orientation		<input type="checkbox"/> N <input type="checkbox"/> NW-S <input type="checkbox"/> E-W <input type="checkbox"/> SW-NE	
Item Description/Justification/Comments			
Nose Fuze Adaptor			
Anomaly type categories (Select Appropriate Box)			
<input type="checkbox"/> UXO <input type="checkbox"/> DMM <input checked="" type="checkbox"/> Munitions Debris <input type="checkbox"/> Practice Ordnance			
<input type="checkbox"/> Inert Ordnance <input type="checkbox"/> Other <input type="checkbox"/> Metal Waste			
Was photo taken?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No File Name: JOAAP-21	
Ordnance Positive Identification (If known, record below and note fuze condition)			
Quantity: 1	Ordnance Item: Mark/Mod:	Nose Fuze: n/a Mark/Mod:	Tail Fuze: n/a Mark/Mod:
Ordnance Filler:	<input type="checkbox"/> Explosive <input type="checkbox"/> Propellant <input type="checkbox"/> Pyrotechnic <input type="checkbox"/> Other		N.E.W.: n/a
Ordnance Category:			
<input type="checkbox"/> Bombs <input type="checkbox"/> Grenades <input type="checkbox"/> Guided Missiles <input type="checkbox"/> Clusters/Dispensers			
<input type="checkbox"/> Land Mines <input type="checkbox"/> Mortars <input type="checkbox"/> Projectiles <input type="checkbox"/> Misc. Explosive Devices			
<input type="checkbox"/> Rockets <input type="checkbox"/> Small Arms <input type="checkbox"/> Underwater Ordnance <input type="checkbox"/> Pyrotechnics and Flares			
Fuzing Types			
<input type="checkbox"/> Piezo-Electric <input type="checkbox"/> Proximity (VT) <input type="checkbox"/> Impact <input type="checkbox"/> Base Detonating <input type="checkbox"/> All-ways Acting <input type="checkbox"/> Electric			
<input type="checkbox"/> Influence <input type="checkbox"/> Mech long delay <input type="checkbox"/> Mechanical Time <input type="checkbox"/> MT Superquick <input type="checkbox"/> Pressure			
<input type="checkbox"/> Powder Train Time Fuze (PTTF) <input type="checkbox"/> Point-initiating, Base-detonating <input type="checkbox"/> Point Detonating (PD)			
Status of MEC/UXO <input type="checkbox"/> Armed <input checked="" type="checkbox"/> Unarmed			
Physical Condition <input type="checkbox"/> Broken Open <input type="checkbox"/> Filler Visible <input type="checkbox"/> Soil Staining <input type="checkbox"/> Soil Sample Taken <input type="checkbox"/> Intact			
FOR SUXOS USE			
Disposition: (Clarify Under Remarks)		<input type="checkbox"/> Transport <input checked="" type="checkbox"/> Leave In Place <input type="checkbox"/> Other	Date:
Notifications To Installation By:		Signature:	Date:
Transported By:		Signature:	Date:
Transferred To:		Signature:	Date:
Destroyed By:		Signature:	Date:
Remarks: Signature: <u></u> SUXOS			

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-01

Date:
03/02/09

Description:

Preparing the GPS unit and all-metals detector for the visual survey.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-02

Date:
03/02/09

Description:

Beginning the instrument-assisted visual survey west of L2.



SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-03

Date:
03/02/09

Description:

Field west of L2 where visual survey was conducted. No items were discovered.


SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-04

Date:
03/02/09

Description:

Wooded area north of L2.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-05

Date:
03/02/09

Description:

MD001

Top view of 1/3 of a base portion from a 155-mm projectile. Size shown relative to a screwdriver. Item found in grassy field east of L2.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID.
JOAAP-06

Date:
03/02/09

Description:

MD001.

Side view of a partial base portion from a 155-mm projectile. Size shown relative to the handheld GPS unit.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-07

Date:
03/03/09

Description:

Conducting the instrument-assisted visual survey through the wooded area southeast of L3.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-08

Date:
03/03/09

Description:

Old foundations in the wooded area located in the southeast edge of the L2-L3 Extended Buffer Area below L3.



SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-09

Date:
03/04/09

Description:

MD002. 155-mm Projectile APERS Ogive. Scale shown relative to handheld GPS unit. Item found in agricultural field east of L3.


SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-10

Date:
03/04/09

Description:

MD002. Closer view of the 155-mm Projectile APERS Ogive.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-11Date:
03/04/09

Description:

MD003. Not Identifiable – Appears to be the remains of a PD or Impact Projectile fuze. Size shown relative to the handheld GPS unit. Item found in agricultural field east of L3.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-12Date:
03/04/09

Description:

MD003. Not Identifiable – Appears to be the remains of a PD or Impact Projectile fuze. Size relative to the handheld GPS unit.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-13Date:
03/04/09

Description:

MD004. 155-mm Projectile APERS Ogive. Size shown relative to a handheld GPS unit. Item found in wooded area east of L3.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-14Date:
03/04/09

Description:

MD004. Closer view of the 155-mm Projectile APERS Ogive.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-15Date:
03/04/09

Description:

Anomaly 001.
Unidentified pipe.
Located near junk pile
along a creek
southeast of L3. Size
shown relative to the
handheld GPS unit.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-16Date:
03/04/09

Description:

Anomaly 001. Grooves
visible on the
unidentified pipe. Stick
is pointing at a groove.



SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-17

Date:
03/04/09

Description:

Anomaly 001. Another groove located near the end of the unidentified pipe.


SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-18

Date:
03/04/09

Description:

Anomaly 002. Unidentified funnel located in vicinity of other junk in the area. Located south of L3. Size shown relative to handheld GPS unit.



SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-19

Date:
03/04/09

Description:

Anomaly 002. Side-view of the unidentified funnel located south of L3. Size shown relative to handheld GPS unit.


SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-20

Date:
03/05/09

Description:

MD005. 76-mm Steel Shot from Canister Projectile. Located in agricultural field east of L3. Size shown relative to handheld GPS unit.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-21

Date:
03/05/09

Description:

MD005. Nose Fuze Adapter. Size shown relative to Chap stick tube. Found in wooded area east of L3.



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-22

Date:
03/03/09

Description:

Old foundations found in wooded area west of L3.



SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-23

Date:
03/03/09

Description:

Old foundations found
in woods west of L3.

SITE INVESTIGATION PHOTOGRAPHIC LOG
Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-24

Date:
03/03/09

Description:

Another view of
foundations found in
woods west of L3.


SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:

Joliet Army Ammunition Plant

Site Name:

L2-L3 Extended Buffer Area

Location:

Wilmington, Illinois

Photo ID
JOAAP-25

Date:
03/03/09

Description:

Old piping found near foundations in woods west of L3.



Appendix C: Geographic Information Systems Data

Appendix C
Geographic Information Systems Data
Items Logged in L2-L3 Extended Buffer Area

Description	Location	Coordinates	
		X	Y
Points of Interest			
Unidentified Metallic Object	SW of L3 – Woods	4579219.32	407932.638
Unidentified Metallic Object	SW of L3 – Woods	4579193.212	408083.634
Former Foundations	W of L3 – Woods	4579537.801	407160.155
Former Foundations	SW of L3 – Woods	4579117.924	407147.252
Former Foundations	SE of L3 – Woods	4579096.311	407956.203
Junk Pile	SE of L3 – Woods	4579194.292	408086.294
Munitions Debris – Discovered During SI Addendum			
MD001 – Partial Base Plate (155mm Projectile)	E of L2 – Ag Field	4580108.833	408426.057
MD002 – 155mm-projectile APERS Ogive	E of L3 – Ag Field	4579551.914	408094.097
MD003 – Possibly partial PD or Impact Projectile fuze	SE of L3 – Ag Field	4579325.965	408171.291
MD004 – 155mm-projectile APERS Ogive	SE of L3 - Woods	4579242.662	408042.844
MD005 – 76mm steel shot from canister projectile	SE of L3 – Ag Field	4579347.78	408115.694
MD006 – Nose Fuze Adaptor	SE of L3 - Woods	4579273.664	408001.705
MEC/Munitions Debris – Discovered by USACE in 2007			
MD	E of L3	4579587.239	407866.663
MD	E of L3	4579550.188	407838.874
MD	E of L3	4579525.487	407869.75
MD	SE of L3	4579408.159	408014.867
MD	SE of L3	4579389.633	407912.977
MD	SE of L3	4579374.195	408033.393
MD	SE of L3	4579346.407	408058.094
MD	SE of L3	4579263.042	407996.342
MD	S of L3	4579176.589	407801.823
MD SW	of L3	4579293.918	407622.742
MD SW	of L3	4579241.428	407471.45
MD SW	of L3	4579303.18	407418.961
MD SW	of L3	4579290.83	407520.852
MD SW	of L3	4579330.969	407548.64
MD SW	of L3	4579352.582	407557.903
MD SW	of L3	4579374.195	407579.516
MD SW	of L3	4579368.02	407536.29
MD SW	of L3	4579352.582	407616.567
MD SW	of L3	4579330.969	407607.304
MD SW	of L3	4579324.794	407607.304
MD SW	of L3	4579324.633	407489.976
MD SW	of L3	4579398.896	407483.8

Appendix C
Geographic Information Systems Data
Items Logged in L2-L3 Extended Buffer Area

MD SW	of L3	4579401.983	407545.552
MD SW	of L3	4579429.772	407536.29
MD SW	of L3	4579448.297	407523.939
MD SW	of L3	4579432.859	407514.676
MD SW	of L3	457914.334	407539.377
MEC	E of L3	4579629.007	407913.992
MEC	E of L3	4579613.132	407865.838
MEC	E of L3	4579517.882	407828.267
MEC	E of L3	4579517.882	407838.321
MEC	E of L3	4579513.648	407840.967
MEC	E of L3	4579511.003	407845.73
MEC	E of L3	4579511.003	407854.196
MEC	E of L3	4579494.069	407867.426
MEC	E of L3	4579535.344	407988.076
MEC	SE of L3	4579378.975	408048.93
MEC	SE of L3	4579359.925	407974.847
MEC	SE of L3	4579372.625	407964.263
MEC	SE of L3	4579362.042	407962.147
MEC	SE of L3	4579372.625	407950.505
MEC	SE of L3	4579351.459	407932.513
MEC	SE of L3	4579342.992	407951.563
MEC	SE of L3	4579334.525	407951.563
MEC	SE of L3	4579404.375	407838.321
MEC	SE of L3	4579377.917	407825.621
MEC	SE of L3	4579373.684	407819.271
MEC	SE of L3	4579331.35	407798.105
MEC	SE of L3	4579298.542	407755.771
MEC	SE of L3	4579223.4	407791.755
MEC SW	of L3	4579345.109	407603.371

Note: Data is in presented meters as recorded in WGS 1984 UTM 16N

Appendix D: Technical Project Planning Meeting Minutes

Kickoff Meeting: 27 June 2008
Technical Project Planning Meeting: 15 October 2008
Technical Project Planning Meeting: 20 July 2009



MEETING MINUTES

Purpose: Joliet Army Ammunition Plant Site Inspection Kickoff Meeting
Stakeholders Meeting 1:30pm – 3:00pm

Location: Wilmington, Illinois

Date: 27 June 2008

Attendees	Organization	Phone	Email
Andrew Maly	USAEC	410-436-1611	andrew.maly@us.army.mil
Kim Gross	USACE-Baltimore	410-962-6735	kimberly.u.gross@usace.army.mil
Christopher Inlow	USACE-Louisville	502-315-6802	chris.inlow@usace.army.mil
Mark Freuh	USACE-Louisville	815-423-5642	mark.m.frueh@usace.army.mil
Nicole Wilson	IEPA	217-785-8729	nicole.wilson@illinois.gov
Art Holz	JOAAP	815-423-2870	arthur.m.holz@us.army.mil
Delores Kaitschuck	USDA	815-423-6370	dKaitschuck@fs.fed.us
Logan Lee	USDA	815-423-6370	llee@fs.fed.us
Kurt Adams	MWH	773-391-4236	kurt.adams@mwhglobal.com
Kathleen Anthony	MKM	916-920-9146	kanthony@mkmengineers.com
Courtney Ingersoll	Malcolm Pirnie	757-873-4415	cingersoll@pirnie.com
Catherine Kelly	Malcolm Pirnie	757-873-4386	ckelly@pirnie.com

The 11 June 2008 kick off meeting for the Military Munitions Response Program (MMRP) Site Inspection (SI) of the L2-L3 Extended Buffer Area for Joliet Army Ammunition Plant (JOAAP), Wilmington, Illinois was conducted by the United States Army Environmental Command (USAEC), United States Army Corps of Engineers (USACE), Baltimore District and Malcolm Pirnie, Inc at JOAAP in Wilmington, Illinois.

The following summarizes discussions held at the JOAAP MMRP SI kick off meeting. These notes do not include a summary of every discussion held, nor do they quote exact words used. Rather, this document is intended to be used by the group in attendance to reference previously held conversations and decisions.

- Introduction
The meeting convened at approximately 1330. All meeting attendees provided personal introductions and explained their role as it relates to the project. This kick off meeting was an agenda item on the JOAAP monthly project management meeting. These minutes encompass all discussions during the meeting.
- Kick Off Briefing
The kick off briefing was given by Ms. Courtney MS Ingersoll and Ms. Catherine Kelly, both of Malcolm Pirnie, Inc. Handouts included a copy of the briefing, and a list of acronyms, and definitions. A copy of the briefing is included in the minutes as Attachment 1.

Comments and discussion generated from the briefing are described below.

- Ms. Ingersoll summarized the MMRP to include a programmatic overview, discussions of definitions and acronyms, description of the MMRP SI implementation, process, and expectations of the stakeholders. Also, results of the Closed, Transferred, Transferring (CTT) Range/Site Inventory and previous MMRP SI were recapped to establish history for the new MMRP SI. What is known to date about the L2-L3 Extended Buffer Area Munitions Response Site (MRS) was discussed.
- Ms. Logan Lee, USDA, suggested the following as additional sources of information:
 - Heritage Group (worked extensively at the cemetery)
 - Science Club came across munitions debris while on the site
 - Environmental Ecologist with U.S. Forest Service came across munitions debris downstream of L4.
- Ms. Lee and Ms. Delores Kaitschuck mentioned they would be having a monthly meeting with some of the aforementioned potential sources of information on 17 June 2008. During the meeting they would ask the meeting participants about the area and if any had encounters with potential Munitions and Explosives of Concern (MEC). Both agreed to a phone interview by Malcolm Pirnie, Inc following the meeting. Malcolm Pirnie proposed Thursday, 19 June 2008, for the interview. Ms. Lee and Ms. Kaitschuck stated that they would be available.
- Concerns about Public Access
 - Although liability ultimately is with the Army, the USDA expressed concerns about public access to the sites. USDA asked if the Army had any specific guidance or rules regarding access to sites such as the L2-L3 Extended Buffer Area MRS. USDA is aware people wander in the area north of Paradise Creek, which lies within the buffer zone, roaming throughout the area and walking down to the road. There was a discussion about what educational material might be readily available from

the Army for public education with regard to the potential MEC hazard at the MRS.

- Mr. Maly will investigate availability for public outreach material from the USAEC for use by USDA.
- Rights of Entry (ROE)
 - Language in the Finding of Suitability for Transfer (FOST) states an open access agreement between the Army and USDA for remedial actions. The FOST most likely covers entry to the MRS for the MMRP SI activities.
 - Although Ms. Lee did not see the need for right of entry on paper, she agreed to sign a form permitting access if requested by the USACE, Baltimore District. Per Ms. Lee, Mr. Bill Mains (wmains@fs.fed.us) is the main Point of Contact (POC) for the USDA.
 - Ms. Gross will work with both the USACE Louisville and Baltimore Real Estate Managers to determine need for an ROE.
- Project Schedule
 - Dates on the proposed schedule may change based on timing of Malcolm Pirnie deliverable submissions and how quickly government and stakeholder reviews are completed. Field work is currently scheduled for 11-19 May 2009. JOAAP suggested Malcolm Pirnie be in the field by late March or April 2009 due to vegetation growth and agricultural land use.
- Previous Site Work Performed by Others
 - Ms. Anthony, MKM, suggested Mr. Troy Pfurtish (phone number: 281-932-8531) as a contact to discuss previous findings from the MMRP Interim Removal Action (IRA) in L2 and L3. Ms. Anthony requested she be contacted before calling to give Mr. Pfurtish a heads up as to the purpose of the call.
 - Ms. Anthony offered GIS data and any other data that might be useful for the L2-L3 Extended Buffer Area SI. This includes their photo log.
 - Ms. Anthony noted MKM found BLU 26's at L3; photographs are included in their photo log.
- Documents Collected

The following documents were collected by Malcolm Pirnie, Inc for use in preparing the Historical Records Review (HRR) for the L2-L3 Extended Buffer Area SI.

 - Engineering Evaluation/Cost Analysis Site L2, L3, L11, L16, L21, L34 (U.S. Army Engineering and Support Center, Huntsville, October 1999)
 - Final Report for the Ordnance Removal and Site Characterization (EODT, September 2001)
 - Final Five-Year Review Report Soils Operable Unit (MWH, April 2004)
 - Final Site Inspection Report (e²M, 25 May 2005)

- Final Remedial Design/Remedial Action Work Plan – Phase 2, Volume II of II (MWH, October 2005)
 - Final Work Plan MEC Removal Action of Sites L2 and L3 (MWH, May 2006)
 - Draft Explosives Safety Submission Amendment for the MMRP Sites L3, L2, and L34 (MKM, July 10, 2006)
 - Final Remedial Action Work Plan for the MMRP Sites L3, L2, and L34 (MKM, October 2006)
 - Draft 2006 Semi-Annual Report for the GW Operable Unit LTM (MKM, March 2008)
 - Draft Site-Specific Final Report MMRP Site L2 (MKM, March 2008)
 - Draft Site-Specific Final Report MMRP Site L3 (MKM, April 2008)
 - In addition, three CDs with numerous documents were obtained from e²M to include in research conducted by Malcolm Pirnie, Inc.
- MRSP Scores
- Mr. Gross asked if the previous MRSP scores had been advertised for public comment. Both Mr. Maly and Mr. Holz were unsure of the status. Mr. Maly offered to follow up with USAEC on the status and check procedure on public comment solicitation for the new MRS.
- Next Steps
- Malcolm Pirnie, Inc will proceed with the HRR. A stakeholder draft will be submitted no later than 7 October 2008.
- Meeting concluded at 1500.

The following action items resulted from this meeting:

- Malcolm Pirnie will provide meeting minutes to all attendees.
- Malcolm Pirnie will conduct a phone interview with USDA on 19 June 2008.
- Mr. Maly will provide public education information for USDA.
- Ms. Gross will check FOST language for the ROE.
- Mr. Maly will check the MRSP public notice status and procedure.

Attachment 1
Military Munitions Response Program Site Inspection
L2-L3 Extended Buffer Area
Joliet Army Ammunition Plant, Wilmington, Illinois
Kick Off Meeting Attendees
(13 pages)



MEETING MINUTES

Purpose: Joliet Army Ammunition Plant Site Inspection Technical Project Planning Meeting
Stakeholders Meeting 10:00am – 12:00pm

Location: Wilmington, Illinois

Date: 15 October 2008

Attendees	Organization	Phone	Email
Tom Barounis	USEPA	312-353-5577	barounis.thomas@epa.gov
Kim Gross	USACE-Baltimore	410-962-6735	kimberly.u.gross@usace.army.mil
Art Holz	JOAAP	815-423-2870	arthur.m.holz@us.army.mil
Courtney Ingersoll	Malcolm Pirnie	757-873-4415	cingersoll@pirnie.com
Catherine Kelly	Malcolm Pirnie	757-873-4386	ckelly@pirnie.com
Delores Kaitschuck	USDA	815-423-6370	dkaitschuck@fs.fed.us
Bill Mains	USDA	815-423-6370	wmains@fs.fed.us
Andrew Maly	USAEC	410-436-1611	andrew.maly@us.army.mil
Greg Peterson	Malcolm Pirnie	760-888-7400	gpeterson@pirnie.com
Nicole Wilson	IEPA	217-785-8729	nicole.wilson@illinois.gov

The 15 October 2008 Technical Project Planning (TPP) Meeting for the Military Munitions Response Program (MMRP) Site Inspection (SI) of the L2-L3 Extended Buffer Area for Joliet Army Ammunition Plant (JOAAP), Wilmington, Illinois was conducted by the United States Army Environmental Command (USAEC), United States Army Corps of Engineers (USACE), Baltimore District and Malcolm Pirnie, Inc. at JOAAP.

The following summarizes discussions held at the JOAAP MMRP TPP meeting. These notes do not include a summary of every discussion held, nor do they quote exact words used. Rather, this document is intended to be used by the stakeholders in attendance to reference previously-held conversations and decisions. Handouts including slides, glossary, and maps were provided to all attendees. Information not presented in the slides and additional discussions are included in the meeting minutes. The following issues were discussed:

- Introduction
 - The meeting convened at approximately 10:00. All meeting attendees provided personal introductions.

- Mike Saffran will be filling in for Chris Inlow (USACE—Louisville) while Chris is on detail until approximately February 2009.
- SI Briefing
The SI briefing was led by Ms. Courtney Ingersoll of Malcolm Pirnie. Handouts included a copy of the briefing and a copy of relevant maps from the Historical Records Review (HRR). A copy of the briefing and sign in sheet is included in the minutes as Attachment 1.

Comments and discussion generated from the briefing are described below.

- Ms. Ingersoll summarized the meeting goals, the SI goals, and the TPP Process, including the TPP Phases, and where the JOAAP SI project falls in the process. Currently, JOAAP is determining data needs and developing data collection methods. Within the MMRP SI framework, munitions of explosive concern (MEC) has been confirmed on site, and data will be collected to determine if an Interim Removal Action is necessary and/or if the site should proceed to a Remedial Investigation/Feasibility Study (RI/FS).
- Mr. Tom Barounis, USEPA, proposed the possibility of conducting an Engineering Evaluation/Cost Analysis (EE/CA) as opposed to an RI later in the MMRP process. Mr. Andrew Maly, USAEC, and Mr. Art Holz, JOAAP, said that an EE/CA has been considered, but future funding will play a large role in how the site is handled. Without the SI data, it is too early to determine how the site will be addressed. However, all avenues will be considered in order to provide the most efficient way to provide appropriate clean-up within the budget. Mr. Maly will be working to get funding for JOAAP as quickly as possible in order to complete the MMRP clean-up.
- Ms. Ingersoll provided a brief summary of the results of the HRR. Mr. Greg Peterson, Malcolm Pirnie, suggested the extended buffer boundary created after the 2007 USACE site walk was likely the radius from the blasting point to the location of the outermost MEC find, whereas the boundary for the extended buffer proposed following the 2007 Removal Action (RA) was determined by the Munitions of Greatest Fragmentation Distance.
- ICM Waiver
 - Mr. Peterson discussed the need for an ICM Waiver when working on site because of previous finds. An ICM Waiver is already in place (approved February 2001), so an amendment will be prepared by Malcolm Pirnie and submitted by the Army prior to conducting field work in Spring 2009.
 - Ms. Kim Gross, USACE, asked Malcolm Pirnie to coordinate with Mr. Paul Greene, USACE, in the submission of an ICM Waiver Amendment.
 - The previously approved ICM Waiver and Amendment will be included as an appendix in the SI Work Plan.

- Rights of Entry (ROE)
 - Ms. Logan Lee, USDA, has previously expressed she has little concern regarding ROEs. However, Ms. Gross will draft a formal ROE request in order to have a record of access permission.
- Proposed Field Activities
 - MEC Survey
 - Mr. Peterson presented proposed field activities to include a magnetometer-assisted MEC visual survey of 10% of the site, covering approximately 40 acres.
 - Mr. Peterson then discussed the field survey in further detail showing a map of an example of what visual survey transects could look like (see Attachment 1), but stressed that transects will be adapted in the field as necessary. Topography as well as MEC finds will dictate where transects are located. Malcolm Pirnie's suggestion is to conduct visual survey transects out to the currently proposed boundary (e.g. L2 and L3 Extended Buffer Area), and if MEC is still being encountered, extend the transects past the buffer area until MEC is no longer found.
 - At each MEC find, a GPS waypoint will be collected, notes on the MEC item will be recorded, and a photograph taken.
 - The areas surveyed by the USACE in 2007 will not be included in the survey.
 - Ms. Dolores Kaitschuck, USDA, expressed concern for the areas of USDA property being leased to farmers. The land was leased before the possibility of MEC was known, but the status of the land has now changed given the possibility of MEC. Ms. Ingersoll and Mr. Holz responded that this is part of the reasoning for making efforts to conduct the survey before Spring 2009 agricultural practices begin. Mr. Peterson confirmed that upon completing the field activities, it will be known if a potential MEC threat exists. This information will be shared with the Army to determine if a revision to the lease is required.
 - Ms. Kaitschuck will communicate with the Army and Malcolm Pirnie regarding priority areas for conducting the survey.
 - Mr. Holz expressed particular concern for the area immediately east of L3.
 - MC Sampling
 - Ms. Ingersoll discussed the potential for 15 surface soil samples during the SI and proposed eliminating these sampling efforts so

the funds would be better used to cover more acreage in the MEC survey. This recommendation was supported with the fact that MC sampling would be part of an RI, therefore Malcolm Pirnie believes surface sampling in the SI is inconsequential as presence of MEC has been determined and the MRS will be recommended for further investigation at completion of the SI. Further, the sites have been sufficiently characterized in previous soil sampling efforts.

- Mr. Holz did not believe sampling of any kind is warranted in the RI since sampling has been conducted previously. Per the 2004 ROD, NFA was received for soil.
- Ms. Ingersoll raised the question of sampling in the instance that certain areas contained no MEC. Would collecting samples in that area give rise to concluding NFA for that parcel of land provided MC constituents fell below RGs? Would IEPA and USEPA accept NFA without chemical sampling?
- Ms. Nicole Wilson, IEPA, does not believe sampling of any kind necessary in this instance since a formal boundary has yet to be established. This SI field work is for the purpose of determining the boundary. Therefore, if no MEC is found, no MC is present and the extended buffer area will not include this area. Ms. Wilson confirmed the suggested boundary is flexible and open to change given the results of the SI field activities.
- Mr. Holz confirmed the original IRP site is the only area that previously contained MC concentrations greater than previously established RGs (2004 Record of Decision). Earlier sampling results in the 200 foot buffer area and the extended buffer area showed MC concentrations in these areas were below RGs.

➤ Field Approach

▪ MEC Survey

- The TPP attendees concluded that the new Munitions Response Site (MRS) does not have to be contiguous. If MEC is not found in a particular area, it will not be included in the MRS.
- Mr. Holz recommended that the stakeholders meet post-field work to examine the data collected during the SI to determine the best method for setting the L2-L3 Extended Buffer Area boundary, and there was stakeholder consensus on this suggestion.

▪ MC Data

- Ms. Ingersoll discussed the need for data to complete the Munitions Response Site Prioritization Protocol (MRSP) forms. She asked if data should be used from the original IRP sites, or should a small number of samples be collected from the extended buffer area for

- these forms only (not to be used in characterization).
- Mr. Holz confirmed samples were collected in this area prior to transfer of the lands to USDA. He suggested referencing this data instead of collecting new data. Ms. Ingersoll agreed to review the data and determine if the analytical data are sufficient for purposes of completing MRSPPs.
- Handling MEC finds
 - Ms. Wilson expressed concern over the procedure for reporting MEC finds. Fort McCoy has been contacted on other sites, and they are not pleased with receiving multiple calls for Army sites. The Sheriff's Office has also been contacted but does not have the training for how to handle and remove MEC.
 - Ms. Gross suggested working with Paul Greene in establishing a protocol for MEC finds.
 - Mr. Peterson suggested using data that is presently available to develop a visual survey approach that starts field efforts in areas of the site expected to be the least probable of encountering MEC, and work to the areas where MEC is known to exist. This approach should minimize work stoppages at the start of the field effort allowing this effort to be completed as efficiently as possible. Some work stoppages, however, are anticipated due to MEC/ICM discoveries, procedures to report MEC/ICM finds will be coordinated with USACE, Baltimore District Mr. Greene.
- Next Steps
 - Malcolm Pirnie will proceed with the SI Work Plan. A stakeholder draft will be submitted no later than 1 December 2008.
- Meeting concluded at 11:45.

The following action items resulted from this meeting:

- Malcolm Pirnie will provide meeting minutes to all attendees.
- Malcolm Pirnie will look at data collected from within the L2-L3 Extended Buffer Area to determine if it is sufficient for completing MRSPPs.
- Malcolm Pirnie will work with USACE to submit an ICM Waiver Amendment.
- Malcolm Pirnie will work with USACE to propose a procedure for notifying the appropriate authorities is MEC/ ICMs is encountered.
- Ms. Gross will submit an ROE request to USDA.
- USDA will communicate with Malcolm Pirnie regarding particular areas of concern for the MEC survey.

Purpose: Joliet Army Ammunition Plant Site Inspection Technical Project Planning Meeting
Stakeholders Meeting 10:00am – 2:30pm

Location: Wilmington, Illinois

Date: 20 July 2009

Attendees	Organization	Phone	Email
Tom Barounis	USEPA	312-353-5577	barounis.thomas@epa.gov
Travis McCoun	USACE-Baltimore	410-962-6728	Travis.Mccoun@usace.army.mil
Art Holz	JOAAP	815-423-2870	arthur.m.holz@us.army.mil
Courtney Ingersoll	Malcolm Pirnie	757-873-4415	cingersoll@pirnie.com
Catherine Kelly	Malcolm Pirnie	757-873-4386	ckelly@pirnie.com
Delores Kaitschuck	USDA	815-423-6370	dkaitschuck@fs.fed.us
Bill Mains	USDA	815-423-6370	wmains@fs.fed.us
Andrew Maly	USAEC	410-436-1611	andrew.maly@us.army.mil
Greg Peterson	Malcolm Pirnie	760-888-7400	gpeterson@pirnie.com
Nicole Wilson	IEPA	217-785-8729	nicole.wilson@illinois.gov

The 20 July 2009 Technical Project Planning (TPP) Meeting for the Military Munitions Response Program (MMRP) Site Inspection (SI) of the L2-L3 Extended Buffer Area for Joliet Army Ammunition Plant (JOAAP), Wilmington, Illinois was conducted by the United States Army Environmental Command (USAEC), United States Army Corps of Engineers (USACE), Baltimore District and Malcolm Pirnie, Inc. at JOAAP.

The following summarizes discussions held at the JOAAP MMRP TPP meeting. These notes do not include a summary of every discussion held, nor do they quote exact words used. Rather, this document is intended to be used by the stakeholders in attendance to reference previously-held conversations and decisions. Handouts including slides and maps were provided to all attendees. Information not presented in the slides and additional discussions are included in the meeting minutes. The following issues were discussed:

- Introduction
 - The meeting convened at approximately 10:00. All meeting attendees provided personal introductions.
- SI Briefing
 - The SI briefing was led by Ms. Courtney Ingersoll (Malcolm Pirnie). Handouts included a copy of the briefing and a copy of relevant maps from the Stakeholder Draft SI Addendum and Historic Records Review (HRR) Report Addendum. A copy of the briefing and sign in sheet is included in the minutes as Attachment 1.

Comments and discussion generated from the briefing are described below.

- Ms. Ingersoll summarized the meeting goals, the SI goals, and the TPP Process, including the TPP Phases and where the JOAAP SI project falls in the process. Within the MMRP SI framework, munitions of explosive concern (MEC) have been confirmed on site. Data was collected during the SI Addendum field work to determine if an Interim Removal Action is necessary and/or if the site should proceed to a Remedial Investigation/Feasibility Study (RI/FS). Analysis of the data suggests further investigation via RI/FS is recommended.
- Mr. Tom Barounis (USEPA) presented some of the comments generated by USEPA. The comment requiring discussion regarded whether 10% of the site was visually surveyed during the field work. Ms. Ingersoll, Mr. Greg Peterson, and Ms. Catherine Kelly (Malcolm Pirnie) explained the site visual survey occurred along the transects presented in the October 2008 TPP meeting and subsequent Final SI Report Addendum Work Plan. Acreage surveyed by the summery 2007 USACE survey was not included in the SI Addendum field work since it had previously been surveyed. Text will be clarified to better explain coverage of the site.
 - Mr. Barounis will email USEPA comments on 21 July 2009.
- Ms. Ingersoll led the discussion presenting the field work completed in March 2009, as well as findings and recommendations. Mr. Peterson described items located in the field. The map with the new proposed boundary for the L2-L3 Extended Buffer Area was discussed.
 - Mr. Bill Mains (USDA) requested that the inner border of the L2-L3 Extended Buffer Area be drawn to connect with the 200-foot buffers so there are no gaps between the two MRSs. Malcolm Pirnie will make the correction.
 - Mr. Mains also requested that the dam be labeled on the map to assist with orientation.
- The proposed MRS boundary was agreed upon by the stakeholders with the above-mentioned modifications.

- Clarification was needed for the symbol denoting “Edge of Contacts” on Figure 4-4. Malcolm Pirnie will clarify the symbol which denotes the point at which contacts were no longer being made on the west side of the MRS by the all-metals detector during the instrument-assisted visual survey. East of this point, several contacts were made, but as the survey continued along the transect moving west of the “Edge of Contacts” point to the MRS boundary, the all-metals did not detect any additional anomalies.
 - Mr. Andrew Maly requested an explanation as to why certain areas were excluded from the proposed L2-L3 Extended Buffer Area when contacts were made by the all-metals detector in the vicinity.
 - Mr. Peterson explained that the “blue dot” (Figure 4-4) west of L2 was along a fence line and is likely associated with the fence or machinery used in agriculture. Nothing else was found in the area except for scrap associated with the fence.
 - Mr. Peterson explained that the “blue dot” located southwest of L3 was surrounded by former foundations, pipes, and other junk. Since nothing else was found in vicinity, the contact was likely related to this abandoned material.
 - Mr. Peterson explained that areas excluded due to swampy nature looked to always be wet. They did not appear to be seasonally wet.
 - Mr. Art Holz (JOAAP) confirmed the L2 and L3 MRSs (areas inside the 200-foot buffer of the IRP sites) have not been transferred.
 - Mr. Travis McCoun (USACE) recommended renaming the MRSs to minimize confusion. Ms. Ingersoll responded this could be done and was a good idea; however, it is USAEC’s decision. General consensus is the current naming convention is acceptable.
-

AFTERNOON SESSION

Discussion of MRSPPs

Attendees: USEPA, IEPA, JOAAP, USAEC, USACE, Baltimore, and Malcolm Pirnie.

(USDA was invited and chose not to attend the afternoon session)

- Ms. Ingersoll presented MRSPp tables for the L2-L3 Extended Buffer Area.
 - Changes to be made to tables:
 - Add “5” to Table 8 since there are residential and commercial establishments within 2 miles of the site
 - Add “5” to Table 9 since both ecological and cultural establishments are present on the site.
 - Update Table 10 accordingly

- Language from Table 5 for the L2-L3 Extended Buffer Area will be edited to match language in Table 5 from the other JOAAP sites (Training Area 7, L34, L2, L3).
- Mr. Maly presented MRSPPs for Training Area 7, L34, L2, and L3.
- Ms. Ingersoll will send Mr. Maly the list of ecological resources (threatened and engendered species).
- Discussion regarding MC at L34: According to the 2005 SI, sampling at L34 occurred in 1981 and 1991. In 1981, concentrations > RGs; in 1991, concentrations < RGs. The MRSPP tables should reflect the 1991 sampling event (Phase I RI). Tables will be updated accordingly. Language from the 2005 SI will be included in the MC tables as appropriate.
- Agreed that the SI Addendum will include the updated MRSPPs from all JOAAP sites since this is an Addendum to the original SI, and the tables have been updated.
- Ms. Ingersoll will send Mr. Maly the MRSPP for the L2-L3 Extended Buffer Area so he can update tables for the other sites as necessary.
- Meeting concluded at 3:30 PM.

The following action items resulted from this meeting:

- ✓ Malcolm Pirnie will provide meeting minutes to all attendees.
- ✓ Mr. Barounis will send USEPA comments to the Army.
- ✓ Malcolm Pirnie will send a Response to Comments table for approval by all stakeholders.
- ✓ Malcolm Pirnie will update MRSPP for L2-L3 Extended Buffer Area according to discussions at the meeting.
- ✓ Mr. Maly will update MRSPPs for Training Area 7, L34, L2, and L3 according to discussions at the meeting.
- ✓ Malcolm Pirnie will send Mr. Maly a list of ecological resources at JOAAP.
- ✓ Malcolm Pirnie will address all comments and issue the Final SI Addendum on or about 19 August 2009.

**Joliet Army Ammunition Plant – L2-L3 Extended Buffer Area
Military Munitions Response Program (MMRP) Site Inspection (SI)
Technical Project Planning Meeting Sign-In Sheet
20 July 2009**

Present	Name	Organization	Title	Telephone	Email
<input type="checkbox"/>	Mark Frueh	USACE—Louisville		815-423-5642 Cell: 815-483-9137	mark.m.frueh@usace.army.mil
<input checked="" type="checkbox"/>	Travis McCoun	USACE—Baltimore		410-436-1611	Travis.Mccoun@usace.army.mil
<input checked="" type="checkbox"/>	Art Holz	JOAAP		815-423-2870	arthur.m.holz@us.army.mil
<input checked="" type="checkbox"/>	Courtney Ingersoll	Malcolm Pirnie, Inc.		757-873-4415	cingersoll@pirnie.com
<input type="checkbox"/>	Christopher Inlow	USACE—Louisville		502-315-6802	chris.inlow@usace.army.mil
<input checked="" type="checkbox"/>	Catherine Kelly	Malcolm Pirnie, Inc.		757-873-4386	ckelly@pirnie.com
<input type="checkbox"/>	Theresa Chase	Midewin			
<input checked="" type="checkbox"/>	Tom Barounis	USEPA		312-353-5577	barounis.thomas@epa.gov
<input checked="" type="checkbox"/>	Andrew Maly	USAEC		410-436-1611	andrew.maly@us.army.mil
<input checked="" type="checkbox"/>	Nicole Wilson	IEPA		217-785-8729	nicole.wilson@illinois.gov
<input type="checkbox"/>	Greg Peterson	Malcolm Pirnie		760-602-3804	gpeterson@pirnie.com
	Dolores Knitschuck	Midewin		815-423-2161	dknitschuck@fs.fed
	BILL MAINS	Midewin/R920		815-423-6370	wmains@fs.fed. 45 fed. us

Military Munitions Response Program (MMRP) Site Inspection (SI) Technical Project Planning Meeting

Joliet Army Ammunition Plant
Wilmington, IL
20 July 2009



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Agenda

1000 - 1005	Introductions / Meeting Goals
1005 - 1020	Review of Site Inspection (SI) Goals and TPP Process
1020 - 1040	Results, Conclusions, Recommendations of Site Inspection
1040 - 1045	Break
1045 - 1130	Review and Discussion of Recommendations
1130 - 1145	Summary of TPP Results / Project Status / Questions
1300 - 1500	Discussion of Draft MRSPS Scoring – All MRSs



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MMRP SI Technical Project Planning Meeting

Joliet Army Ammunition Plant

PART ONE: Introductions, Meeting Goals



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Introduction

- Program Manager – US Army Environmental Command (USAEC)
- Executing Agent –USACE, Baltimore District
- Contractor Team – Malcolm Pirnie

- Installation POC – Art Holz
- USAEC Program Manager – Mary Ellen Maly
- USACE Project Manager – Travis McCoun
- USAEC Environmental Restoration Manager – Andrew Maly
- Pirnie Program Manager – Heather Polinsky
- Pirnie Project Manager – Courtney Ingersoll
- Pirnie Field Project Manager – Catherine Kelly
- Pirnie UXOSO – Greg Peterson
- USACE, Louisville District – Chris Inlow
- EPA Region 5 Representative – Tom Barounis
- Illinois EPA – Nicole Wilson
- USDA – Teresa Chase



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Meeting Goals

- Review objectives of project / Site Inspection
- Review results / conclusions of Site Inspection
- Identify concerns
- Review recommendations of Site Inspection
- Review MRSPPs from all MMRP sites
- Comments on the MRSPPs
- Achieve consensus on next action – if applicable



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PART TWO:
Review of TPP Process &
Summary of MMRP SI Goals



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TPP Process

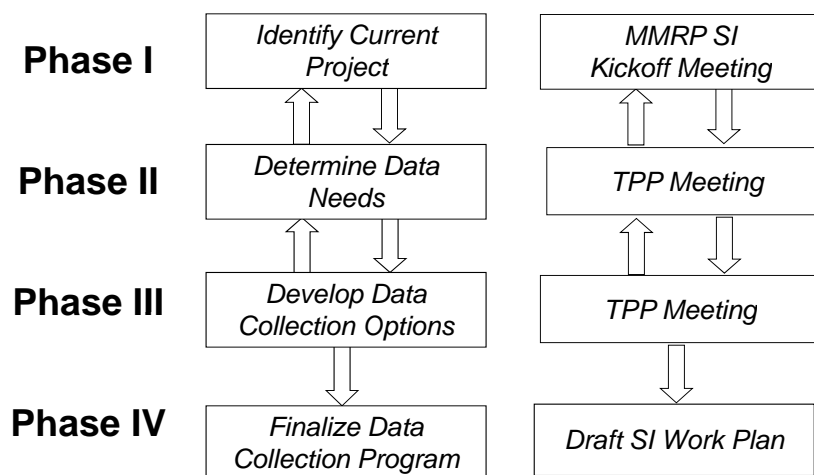
- Developed by US Army Corps of Engineers
- Comprehensive systematic planning tool
 - Type, quality, and quantity of data
 - Meet project objectives
 - 4 phase program
 - Iterative



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TPP Phases



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MMRP Summary

- MMRP is directed by:
 - Law
 - OSD
 - Army
- MMRP provides for the investigation and response at sites with:
 - MEC (UXO / DMM)
 - MC
- PA ⇨ SI ⇨ RI ⇨ FS ⇨ RD ⇨ RA ⇨ LTM



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MMRP SI Project Goals

- Primary Goal
 - Collect information necessary to make a decision if the following actions are warranted at the site:
 - MMRP Remedial Investigation/Feasibility Study (RI/FS);
 - Interim Response - Emergency or Time Critical (Removal Action) Required; or
 - No Further Action Determination.
- Secondary Goals
 - Collect necessary information required to improve Cost to Complete (CTC) estimate; and
 - Complete draft Munitions Response Site (MRS) Prioritization Protocol.



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MMRP SI Steps

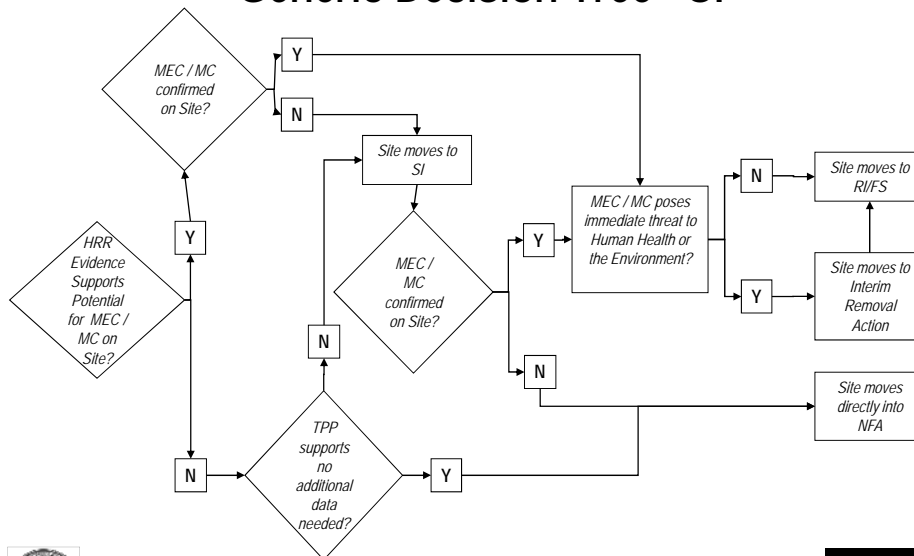
- ✓ Stakeholder identification
- ✓ Historic records search
- **Technical project planning**
- ✓ Site Inspection



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Generic Decision Tree - SI



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MMRP SI

Technical Project Planning Meeting

Joliet Army Ammunition Plant

PART THREE:

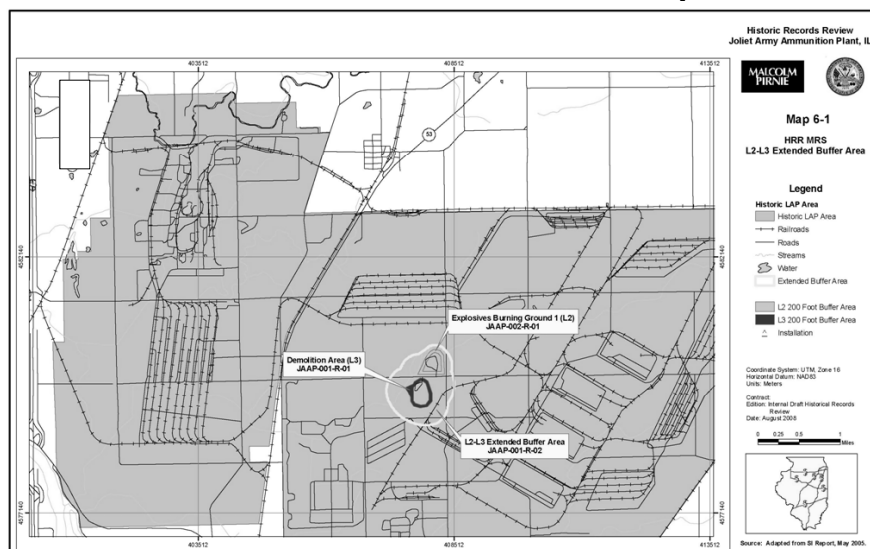
Results, Conclusions, and Recommendations



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HRR Results Overview Map



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Summary of TPP Decisions

- SI tasks were determined during the TPP session held on 15 October 2008.
- The results of the TPP session dictated both the MEC/MD field activities and decision not to collect MC samples.
- The results of the TPP session dictated the basis for NFA or RI recommendations.
- Additional communications after the TPP session resulted in the decision no addendum to the ICM waiver was needed.



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Summary of TPP 2 Decisions

- Stakeholders agreed the purpose of the SI was for refinement of the L2-L3 Extended Buffer Area boundary.
- Stakeholders concurred if no MEC/MD is discovered during the SI, the site boundary will be refined to reflect the SI field results. As such, no MEC/ MD, no MC. Therefore stakeholders agreed MC sampling would not be necessary in the SI. Should additional MC sampling be necessary, it would occur in the RI.
- Stakeholders concluded the L2-L3 Extended Buffer Area boundary does not need to be contiguous.



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Summary of MEC TPP 2 Decision

MRS	MEC SI Activities	
	Activity	Purpose
L2-L3 Extended Buffer Area	Instrument-assisted surface sweep / visual survey of approximately 40 acres (10% of site acreage)	To support MEC NFA or RI/FS determination. If no MEC are identified, the site qualifies for NFA. If MEC are encountered, the site will move to an RI/FS. The site will be surveyed in a manner to better define a boundary of the extent of MEC on the MRS.



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Summary of MC TPP 2 Decision

MRS	MC SI Activities	
	Activity	Purpose
L2-L3 Extended Buffer Area	No field work will be completed in association with MC. Samples were previously collected in this area, which then received an NFA designation with regard to soil during the 2004 Record of Decision.	Data previously collected will be referenced as appropriate in the SI Report.

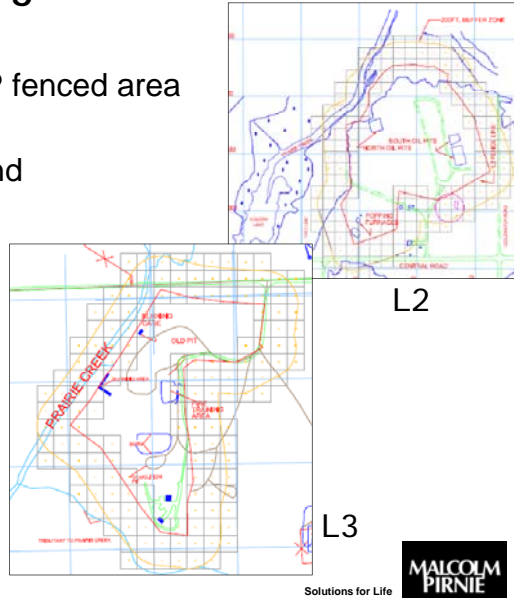


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HRR Findings – 1999 EE/CA

- MEC located outside IRP fenced area at depths less than 1'
- Based on historic use and management of site
- L2 - 22 Ac in 200' perimeter around IRP site recommended for RA
- L3 – 24 Ac in 200' perimeter around IRP site recommended for RA



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HRR Findings – 2001 Ordnance Removal and Site Characterization Report

- L2
 - MEC occasionally kicked out during burning activities
 - Only fragments of a BLU-26/B were found outside the fence line
 - 92 MEC items found inside the fence line (IRP site) – near boundary – therefore RA recommended for 200' perimeter
- L3
 - MEC occasionally kicked out during burning activities
 - Only one-half of one BLU-26/B was found outside the fence line
 - 30 MEC items found inside the fence line (IRP site) – near boundary – therefore RA recommended for 200' perimeter

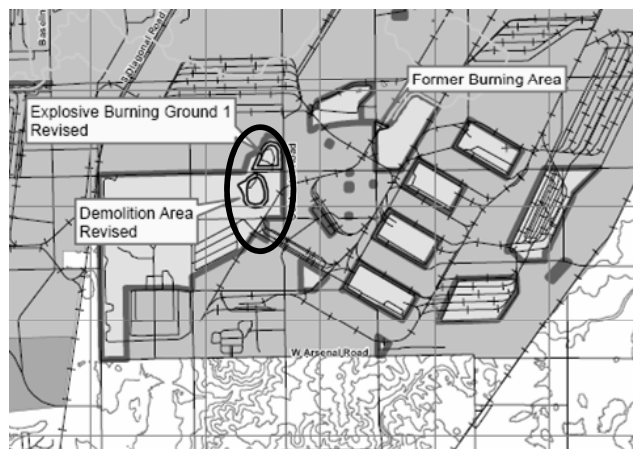


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HRR Findings – 2005 MMRP SI

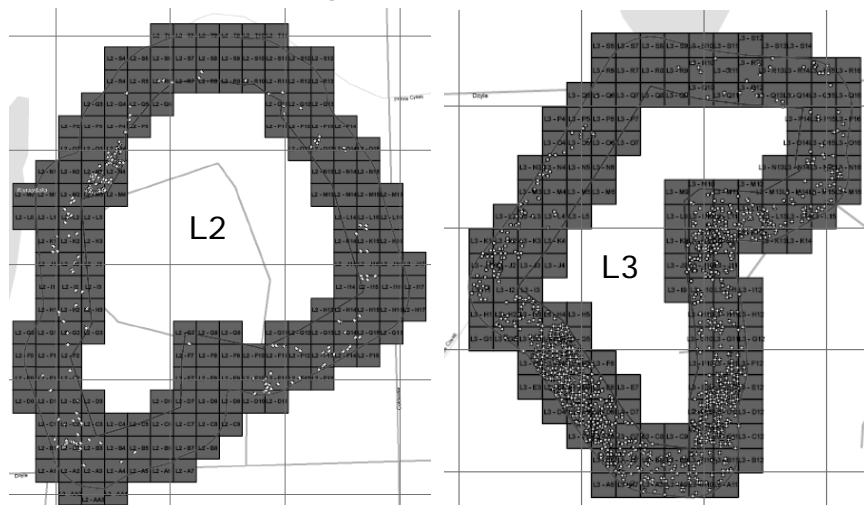
- MRS delineation based on recommendations from the 1999 EE/CA and 2001 ORSC.
- L2 (JAAP-002-R-01) = 200' perimeter around L2
- L3 (JAAP-001-R-01) = 200' perimeter around L3



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HRR Findings – 2007 RA - MEC Finds



JAAP-002-R-01

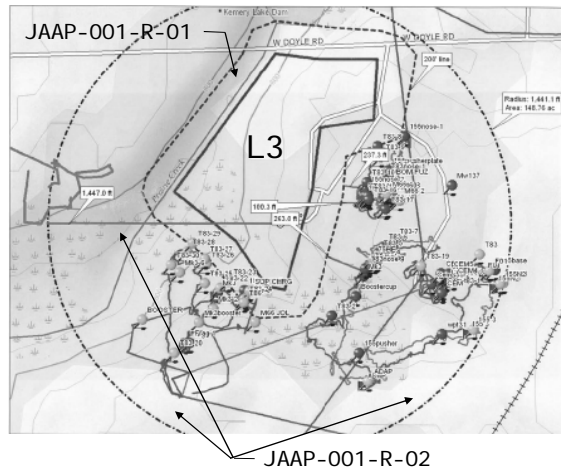
JAAP-001-R-01

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HRR Findings - 2007 Site Walk L3 MEC Finds

- USACE OESS and a contractor led team conducted a site walk outside L3 during the Summer 2007.
- Locations of MEC finds are marked by blue and red circles. Paths walked are seen by red lines.
- MEC is found up to the estimated extended buffer boundary.

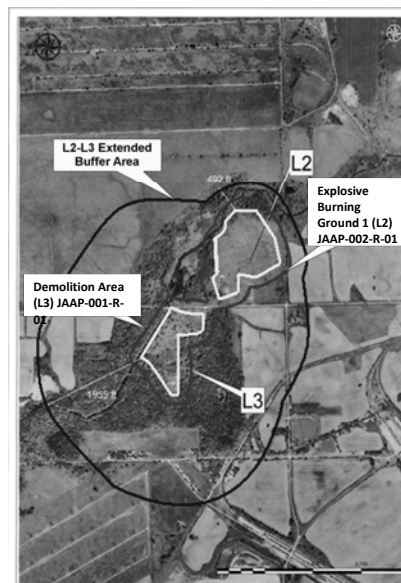


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HRR Findings – 2007 – RA - Conclusions

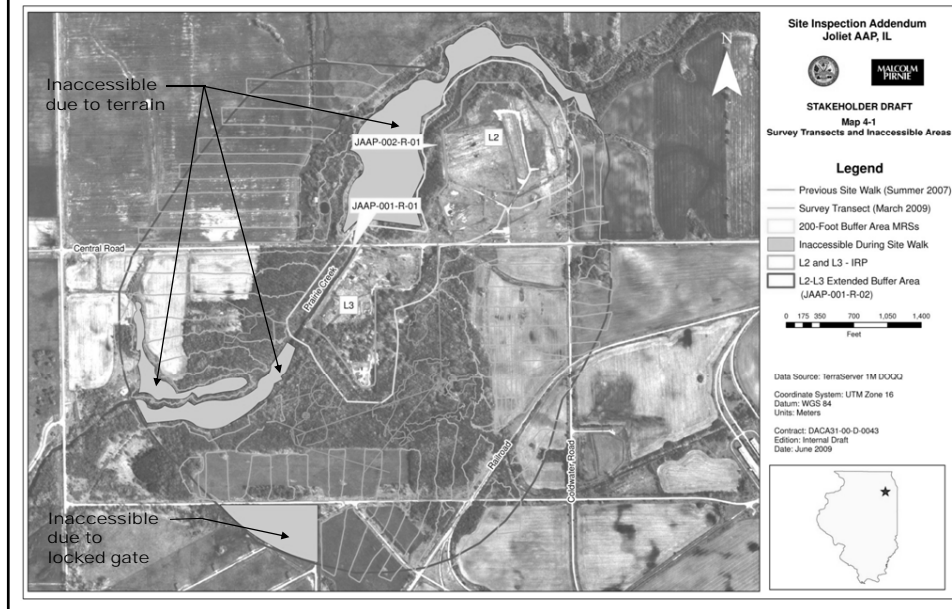
- EE/CA was implemented and recommendations carried through initial MMRP SI (200' buffer around IRP sites JAAP-0L2 and JAAP-0L3 = MRSs)
- MRSs not inclusive of MEC
- New MRS result of physical observation of MEC beyond boundaries of JAAP-001-R-01 and JAAP-002-R-01.
- Site is approximately 396 Ac
- Former Demolition Area and Explosive Burning Ground.
- Current land use is agricultural/recreational



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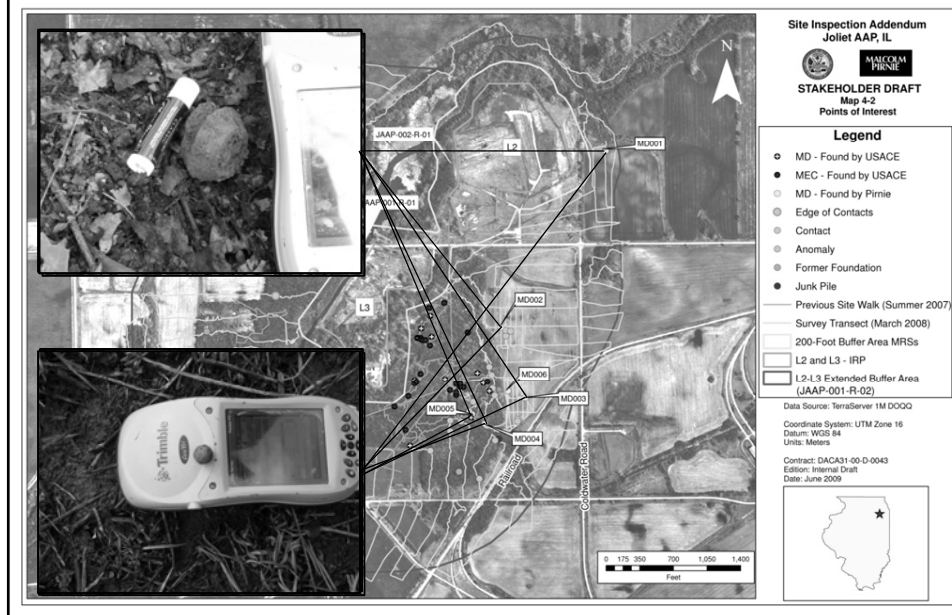


SI Field Activities

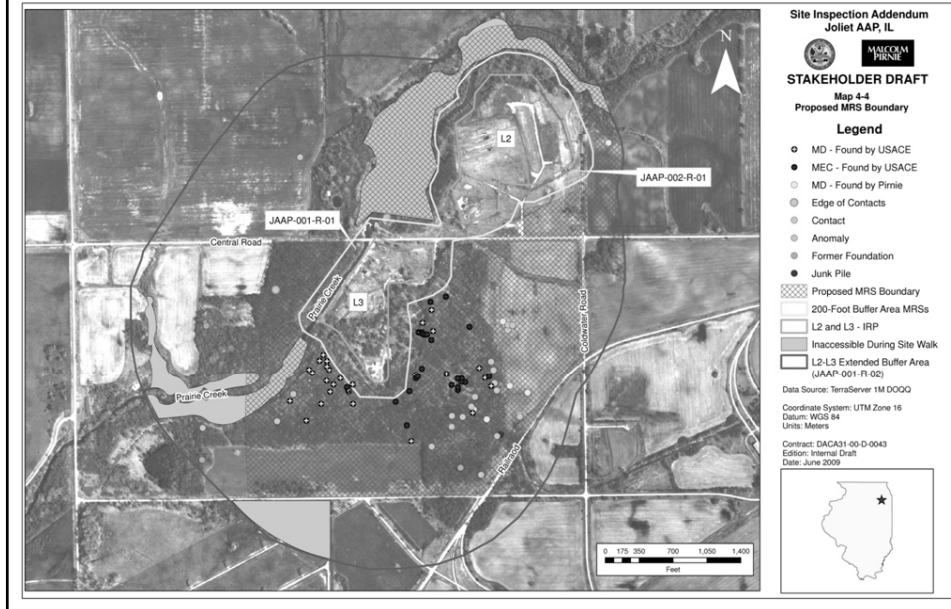


CMS11

SI Findings



Proposed MRS Boundary



SI Conclusions and Recommendations

Conclusions

- The findings of the MEC SI field activities indicate MEC and MD evidence in the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS. This evidence indicates that a percentage of the L2-L3 Extended Buffer Area (JAAP-001-R-02) MRS to the east and southeast has moderate to heavy MEC and/or MD present and the south and southwest portions have light to moderate MEC and/or MD present.

Recommendations

- Further investigation via a Remedial Investigation is recommended.



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JOAAP MMRP SI Project Schedule

- ✓ Kick off and Site Visit – 11 Jun 2008
- ✓ Data Collection Trip Report & Meeting Minutes – 8 Jul 2008
- ✓ Stakeholder Draft HRR – 15 Sep 2008
- ✓ DQO Planning Session (TPP) – 15 Oct 2008
- ✓ Final HRR – 13 Nov 2008
- ✓ Stakeholder Draft SI Work Plan – 18 Dec 2008
- ✓ Final SI Work Plan – 13 Feb 2009
- ✓ MMRP SI MEC/MC Field Work – 1-6 Mar 2009
- ✓ Stakeholder Draft SI Report – 22 Jun 2009
- ✓ TPP Session 2 – 20 Jul 2009
 - Final TPP Session 2 Meeting Minutes – 5 Aug 2009
 - Final SI Report – 19 Aug 2009
 - ERIS Upload and GIS Deliverable – 7 Sep 2009

Schedule dates are tentative

Schedule Assumes: Internal Army reviews 20 working days; Stakeholder reviews 45 days.



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Questions?



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PART FOUR: MRSPPs



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MRSPP Stakeholder Notification

Requirements:

- Notify stakeholders of the opportunity to participate in the Protocol application. The Army shall notify the stakeholders seeking their involvement prior to beginning prioritization.
- Publish an announcement, prior to beginning the prioritization, in local community publications requesting information pertinent to prioritization or sequencing decisions of the MRS, to ensure the local community is aware of the opportunity to participate in the application of the rule.

See 32 CFR § 179.5 for specific regulatory language



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MRSPS Stakeholder Notification

Process:

- Notification letter to be sent and public announcement published by Installation prior to finalization of the HRR, or as soon as feasible.
 - Environmental Protection Agency
 - Other federal agencies
 - State regulatory agencies,
 - Local restoration advisory boards
 - Technical review committees
 - Local community stakeholders
 - Current land owners (if the land is outside of DOD control)
- If requested, a meeting can be conducted to allow participation in the scoring process.
- Stakeholders will have the opportunity to review and comment on the draft MRSPS scores within the Draft SI Report.
- If no requests for a meeting and/or comments on the initial scores within 30-days of submittal of the Draft SI Report -- Scores will be final within the Final SI Report.



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Joliet Army Ammunition Plant

Back Up Slides



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Acronym List

A/I	Active/ Inactive	MEC	Munitions and Explosives of Concern
BRAC	Base Realignment and Closure	MRA	Munitions Response Area
BD/DR	Building Demolition/ Debris Removal	MRS	Munitions Response Site
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	MRSP	Munitions Response Site Prioritization Protocol
CTC	Cost to Complete	OE	Ordnance and Explosives
CTT	Closed, Transferred, and Transferring	PE	Preliminary Assessment
DERP	Defense Environmental Restoration Program	POC	Point of Contact
DMM	Discarded Military Munitions	RAC	Risk Assessment Code
DoD	Department of Defense	RCRA	Resource Conservation and Recovery Act
FUDS	Formerly Used Defense Site	SI	Site Inspection
HRR	Historical Records Review	TPP	Technical Project Planning
IRP	Installation Restoration Program	UXO	Unexploded Ordnance
MC	Munitions Constituents	USACE	U.S. Army Corps of Engineers
MMRP	Military Munitions Response Program	USAEC	U.S. Army Environmental Command



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Presentation References

1. FY02 DERP Annual Report to Congress
2. USAEC, MMRP Public Affairs Package
3. DERP Management Guidance, Sept 2001
4. USACE, Program Management Plan MMRP SI
5. USACE, EM 200-1-2, Technical Planning Process, 31 Aug 1998
6. 32 CFR Part 179, Munitions Response Site Prioritization Protocol



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MMRP Overview

Military Readiness:

- The level of military readiness necessary to deter adversaries and defend our nation require the Department of Defense (DoD) to develop, test, and deploy weapons systems and military munitions, and then train its personnel to use and maintain these systems
- The U.S. Armed Forces are the most well- trained, well equipped Military fighting forces in the world, because they train as they fight, under realistic battle conditions

Explosives Contamination:

- As a result, some former DoD defense sites historically used to accomplish the Defense mission may contain unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC)

DoD Response to Concerns: MMRP

- In 2001, Congress and DoD created the MMRP to address human health, safety, and environmental concerns at defense sites



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Definitions

UXO (Unexploded Ordnance) – Ordnance that was fired, but did not function properly and remains unexploded.

DMM (Discarded Military Munitions) – Munitions that have been improperly abandoned or disposed. Generally buried.

MC (Munitions Constituents) – Chemical residues originating from UXO or DMM. **Does not include production wastes (lagoons, spills, contaminated production buildings, etc.).**

MEC (Munitions and Explosives of Concern) – Includes UXO, DMM, and MC (at high enough concentrations [10%] to pose an explosive hazard).

MRA (Munitions Response Area) – Property known or suspected to contain MEC or MC.

MRS (Munitions Response Site) – A discrete location within a Munitions Response Area (MRA) requiring a munitions response.



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Definitions (continued)

Range:

A designated land or water area set aside, managed, and used to conduct research on, develop, and evaluate military munitions and explosives, other ordnance, or weapons systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.

Other than Operational Range:

Closed, Transferred, Transferring (CTT) Range

Operational Range:

Range under control of DoD used for range activities, or if not used, is considered by DoD to be a range and has not been put to use for activities incompatible with range activities



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Definitions (continued)

Military Munitions Response:

- Response actions to address UXO, DMM, MC

Defense Site:

- Is or was owned by, leased to, or possessed by DoD
- Not including sites with releases after 30 September 2002 or:

Operational Ranges	Munitions in an operating storage or manufacturing facility	Facility used for or was permitted for the treatment or disposal of military munitions
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Definitions (continued)

Military Munitions:

- Includes munitions ranging from small arms to large bombs, and other items such as chemical warfare agents, but not inert items and nuclear devices.

All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components, except that the term does include non nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed.

Complete definition can be found in 32 CFR Part 179, Munitions Response Site Prioritization Protocol



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MMRP Programmatic Overview

Background:

- Defense Environmental Restoration Program (DERP) is DoD's cleanup program.
- Sep 2001 DoD DERP Management Guidance
 - designated the MMRP as a new program element
 - provides information and guidance on implementation
- MMRP was established to address human health, safety, and environmental concerns at defense sites with:
 - Munitions and explosives of concern (MEC), which include
 - Unexploded ordnance (UXO) and
 - Discarded military munitions (DMM)
 - Munitions constituents (MC)
- FY02 Defense Authorization Act modified the DERP Guidance
 - Required the Services to complete an inventory of defense sites with MEC or MC
 - Required DoD to develop a Prioritization Protocol to assign cleanup priority to sites

Note – At FUDS and BRAC sites, munitions have historically been addressed, but this is a very new area for Active Installations!



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MMRP Programmatic Overview Cont.

Army Completed their Range Inventory Program from 2000 - 2003

- Phase 1 Electronic survey: late 2000, operational and other than operational ranges, US & overseas, "range complexes"
- Phase 2 Operational Range Inventory: Oct 2000 to Jan 2003
- Phase 3 Other than Operational Ranges & Defense Sites Inventory: Oct 2001 to Dec 2003, resulting in:
 - 183 Installations w/ Munitions Response Sites
 - 937 Munitions Response sites
 - Joliet AAP Other than Operational Range Inventory – September 2002



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MMRP Programmatic Overview Cont.

DoD MMRP Goals:

- In 2004, DoD established 2 MMRP goals for the Services:
 - Complete all Preliminary Assessments (PAs) by 2007
 - Complete all Site Inspections (SIs) by 2010
- PA goal met in Dec 2003 through completion of the Phase 3 Range Inventory
- SIs began in FY03 to be completed in FY10



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MMRP Programmatic Overview Cont.

MMRP Eligibility:

- Releases before 30 Sep 02
- Not an operational range
- Not a permitted munitions disposal facility
- Site not in AEDB-R or, if site is in AEDB-R as IRP site, its CTC doesn't include all costs for UXO, DMM or MC

Note – Release for munitions means shooting, firing, or placement



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MMRP Programmatic Overview Cont.

Similarities/Difference Between MMRP & IRP

Similar

- Follows CERCLA or RCRA
- Same Funding Source (ER,A)
- IAPs
- Stakeholder Participation
- DSMOA

Different

- Centrally managed by USAEC through the SI Phase – AEDB-R & CTCs
- Risk Assessment for MEC
- Explosive Safety Submittals
- MRS Prioritization Protocol
- Funding Priorities
- Program Goals



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MMRP Programmatic Overview Summary

- The September 2001 DERP Management Guidance and the National Defense Authorization Act of FY02 established the MMRP to address MEC and MC at defense sites. The MMRP:
 - is a new program element of the DERP.
 - follows CERCLA and the National Contingency Plan (may also be implemented under RCRA Corrective Action).
 - only applies to other than operational ranges where MEC and MC is known or suspected and the release occurred prior to 30 Sep 02.
- The Phase 3 Army Range Inventory:
 - Identified MMRP eligible sites
 - Is considered the PA
 - Is the starting point for the SI



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Appendix E: Military Munitions Response Site Prioritization Protocol (MRSPP)

MRSPPs for all Munitions Response Sites (MRSs) have been included in this Final SI Report Addendum. MRSPPs previously submitted for JAAP-001-R-01, JAAP-002-R-01, JAAP-003-R-01, and JAAP-004-R-01 were updated in August 2009 based on new site data from the 2007 Removal Action.

Munitions Response Sites Include:

Demolition Area (L3): JAAP-001-R-01
L2-L3 Extended Buffer Area: JAAP-001-R-02
Explosive Burning Ground 1 (L2): JAAP-002-R-01
Training Area 7: JAAP-003-R-01
Former Burning Area (L34): JAAP-004-R-01

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: Demolition Area (L3)

Component: Army, Non-BRAC Excess

Installation/Property Name: Joliet Army Ammunition Plant

Location (City, County, State): Wilmington, Will County, Illinois

Point of Contact/Phone No.: Art Holz; 815-423-2870

Site Name/Project Name (Project No.): JAAP-001-R-01

MRSP Score (Date Scored): 14 August 2009

Preparer's Name (Organization): Andrew Maly (USAEC)

MRSP Rating: 3

Date Information Entered/Updated: 14 August 2009; Information contained within this scoring was obtained from sources within the Joliet AAP Administrative Record.

Point of Contact (Name/Phone): Andrew Maly, 410.436.1611

Project Phase (check only one):

<input type="checkbox"/> PA	<input type="checkbox"/> SI	<input type="checkbox"/> RI	<input type="checkbox"/> FS	<input type="checkbox"/> RD
<input type="checkbox"/> RA-C	<input type="checkbox"/> RIP	<input type="checkbox"/> RA-O	<input type="checkbox"/> RC	<input checked="" type="checkbox"/> LTM

Media Evaluated (check all that apply):

<input checked="" type="checkbox"/> Groundwater	<input type="checkbox"/> Sediment (human receptor)
<input checked="" type="checkbox"/> Surface soil	<input type="checkbox"/> Surface Water (ecological receptor)
<input type="checkbox"/> Sediment (ecological receptor)	<input type="checkbox"/> Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

Ammunition manufacturing, load, assemble, and packaging occurred between 1941 and 1977. The plant made many types of munitions, including ICM and up to 8-inch Howitzer HE projectiles. This MRS is a boundary around a former demolition area, used for the disposal of off-spec items. Remedial action,

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

consisting of clearance to 1' depth was conducted in 2007 (HRR Addendum, 2008—Section 2).

Description of Pathways for Human and Ecological Receptors:

Soil is considered to be a complete pathway for Human and Ecological Receptors. MC data was reevaluated to include data from the MRS and not the adjacent IRP site.

Description of Receptors (Human and Ecological):

Human access to the site is limited. The only threatened or endangered species potentially inhabiting JOAAP are grassland birds, including bobolinks, upland sandpipers, and Henslow's sparrows (SI Addendum, 2009—Section 4.1.4.4.3).

Table 1**EHE Module: Munitions Type Data Element Table**

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	<ul style="list-style-type: none"> UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). Hand grenades containing energetic filler. Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard. 	30
High explosive (used or damaged)	<ul style="list-style-type: none"> UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." DMM containing a high-explosive filler that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	25
Pyrotechnic (used or damaged)	<ul style="list-style-type: none"> UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	20
High explosive (unused)	<ul style="list-style-type: none"> DMM containing a high-explosive filler that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	15
Propellant	<ul style="list-style-type: none"> UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: <ul style="list-style-type: none"> Damaged by burning or detonation Deteriorated to the point of instability. 	15
Bulk secondary high explosives, pyrotechnics, or propellant	<ul style="list-style-type: none"> DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. 	10
Pyrotechnic (not used or damaged)	<ul style="list-style-type: none"> DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	10
Practice	<ul style="list-style-type: none"> UXO that are practice munitions that are not associated with a sensitive fuze. DMM that are practice munitions that are not associated with a sensitive fuze and that have not: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	5
Riot control	<ul style="list-style-type: none"> UXO or DMM containing a riot control agent filler (e.g., tear gas). 	3
Small arms	<ul style="list-style-type: none"> Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.) 	2
Evidence of no munitions	<ul style="list-style-type: none"> Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
MUNITIONS TYPE	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	30

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
<p>DIRECTIONS: Document any MRS-specific data used in selecting the <i>Munitions Type</i> classifications in the space provided.</p> <p>The site is a 200-foot buffer zone surrounding the IRP site JAAP-0L3, Demolition Area. The Demolition Area consisted of “U” and “L” shaped bermed areas and a burning cage, which was a concrete pad surrounded by a steel mesh cage used to contain the burning debris. Based on work performed c. 1999, a 200-foot buffer was established around the Demolition Area based on the maximum estimated blast radius of items suspected to have been destroyed at the Area.</p> <p>Work to clear the site to 1’ depth was put under contract 2005, and work began and was completed in 2007. The site-specific final report for this site (currently draft) indicates the type and quantity of MEC items recovered. The most significant items were BLU 26 and BLU 32, which are the basis for increasing the score for this Table (Draft Final Site-Specific Report MMRP Site L3, 2008).</p>		

Table 2
EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with all the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range*, *practice munitions*, *small arms range*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	♦ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	10
Former munitions treatment (i.e., OB/OD) unit	♦ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	♦ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	♦ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	♦ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	♦ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	♦ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	♦ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	♦ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	♦ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	8

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space provided.

Historical records indicate this site is in the kick-out boundary of an area used for demolition of UXO and DMM (SI Report, 2005—Section 4.1).

Table 3**EHE Module: Location of Munitions Data Element Table**

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with all the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed*, *surface*, *subsurface*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	<ul style="list-style-type: none"> Physical evidence indicates that there are UXO or DMM on the surface of the MRS. Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS. 	25
Confirmed subsurface, active	<ul style="list-style-type: none"> Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. 	20
Confirmed subsurface, stable	<ul style="list-style-type: none"> Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. 	15
Suspected (physical evidence)	<ul style="list-style-type: none"> There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS. 	10
Suspected (historical evidence)	<ul style="list-style-type: none"> There is historical evidence indicating that UXO or DMM may be present at the MRS. 	5
Subsurface, physical constraint	<ul style="list-style-type: none"> There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM. 	2
Small arms (regardless of location)	<ul style="list-style-type: none"> The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.) 	1
Evidence of no munitions	<ul style="list-style-type: none"> Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
LOCATION OF MUNITIONS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 25).	20

DIRECTIONS: Document any MRS-specific data used in selecting the **Location of Munitions** classifications in the space provided.

In 2007, MKM and PIKA International performed a 1' surface clearance of the site. During the clearance operations, the site was subject to flooding, and this resulted in the exposure of previously buried items (which were also cleared). The site will be subject to regular flooding due to its proximity to Prairie Creek. The clearance is documented in the site specific report (Draft Final Site-Specific Final Report MMRP Site L3, 2008).

Table 4**EHE Module: Ease of Access Data Element Table**

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	♦ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	♦ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8
Barrier to MRS access is complete but not monitored	♦ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	♦ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0
EASE OF ACCESS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Ease of Access** classification in the space provided.

The public has no access to this site; the site is surrounded by a fence with a locked gate, and only two keys exist for the lock. All visitors must be accompanied by facility personnel; however, the area is not monitored to prevent trespassers from gaining access (HRR Addendum, 2008—Section 5.3.2).

Table 5**EHE Module: Status of Property Data Element Table**

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	<ul style="list-style-type: none"> ♦ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day. 	5
Scheduled for transfer from DoD control	<ul style="list-style-type: none"> ♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied. 	3
DoD control	<ul style="list-style-type: none"> ♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year. 	0
STATUS OF PROPERTY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the **Status of Property** classification in the space provided.

The planned future use for this site is open space for the USDA Midewin National Tallgrass Prairie (HRR Addendum, 2008—Section 5.3.2).

Table 6**EHE Module: Population Density Data Element Table**

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the highest population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	5
100–500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	3
< 100 persons per square mile	♦ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Density** classification in the space provided.

U.S. Census Bureau 2000 data, Will County = 296 – 600 persons per square mile. The maximum data class of persons per square mile in the town of Wilmington, which is the closest town to the site is 367.

Table 7**EHE Module: Population Near Hazard Data Element Table**

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the number of inhabited structures.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	♦ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5
16 to 25 inhabited structures	♦ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	♦ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	♦ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	♦ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	♦ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Near Hazard** classification in the space provided.

Homes, offices, a feed mill, and agricultural lands are located within 2 miles of this site. Recent development has increased the number of inhabited structures located up to 2 miles from the boundary of the MRS (HRR Addendum, 2008—Section 5.3.2).

Table 8**EHE Module: Types of Activities/Structures Data Element Table**

DIRECTIONS: Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the scores that correspond with all the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5
Parks and recreational areas	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4
Agricultural, forestry	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2
No known or recurring activities	♦ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Types of Activities/Structures** classifications in the space provided.

Homes, offices, a feed mill, and agricultural lands are located within 2 miles of this site. The planned future use for this site is open space for the USDA Midewin National Tallgrass Prairie which is also presently located within 2 miles of the site. Recent development has increased the number of residences located within 2 miles of the MRS (HRR Addendum, 2008—Section 5.3.2).

Table 9**EHE Module: Ecological and/or Cultural Resources Data Element Table**

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	♦ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	♦ There are ecological resources present on the MRS.	3
Cultural resources present	♦ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	♦ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the *Ecological and/or Cultural Resources* classification in the space provided.

This site is adjacent to Prairie Creek and Kemery Lake. An ecologist at Midewin Tallgrass Prairie confirmed that grassland birds are the only threatened and endangered species at JOAAP. These birds include bobolinks, upland sandpipers, and Henslow's sparrows (HRR Addendum, 2008—Section 5.3.3.2).

Table 10
Determining the EHE Module Rating

	Source	Score	Value	
DIRECTIONS: 1. From Tables 1–9, record the data element scores in the Score boxes to the right. 2. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. 3. Add the three Value boxes and record this number in the EHE Module Total box below. 4. Circle the appropriate range for the EHE Module Total below. 5. Circle the EHE Module Rating that corresponds to the range selected and record this value in the EHE Module Rating box found at the bottom of the table. Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.	Explosive Hazard Factor Data Elements			
	Munitions Type	Table 1	30	38
	Source of Hazard	Table 2	8	
	Accessibility Factor Data Elements			
	Location of Munitions	Table 3	20	28
	Ease of Access	Table 4	5	
	Status of Property	Table 5	3	
	Receptor Factor Data Elements			
	Population Density	Table 6	3	16
	Population Near Hazard	Table 7	5	
	Types of Activities/Structures	Table 8	5	
	Ecological and/or Cultural Resources	Table 9	3	
	EHE MODULE TOTAL			82
	EHE Module Total		EHE Module Rating	
	92 to 100		A	
82 to 91		B		
71 to 81		C		
60 to 70		D		
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected Explosive Hazard		
EHE MODULE RATING		B		

Table 11**CHE Module: CWM Configuration Data Element Table**

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with all the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ CWM that are UXO (i.e., CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. 	30
CWM mixed with UXO	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO. 	25
CWM, explosive configuration that are undamaged DMM	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. 	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container). 	15
CAIS K941 and CAIS K942	<ul style="list-style-type: none"> ♦ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. 	12
CAIS (chemical agent identification sets)	<ul style="list-style-type: none"> ♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. 	10
Evidence of no CWM	<ul style="list-style-type: none"> ♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. 	0
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

DIRECTIONS: Document any MRS-specific data used in selecting the **CWM Configuration** classifications in the space provided.

The historical use of the site did not include CWM (HRR Addendum, 2008—Section 4.3.3). EODT performed a site characterization for this area in 2001 and no CWM was found. Site clearance to 1' depth conducted in 2007 did not find any CWM (Draft Final Site-Specific Final Report MMRP Site L3, 2008).

Tables 12 - 19

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with all the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *CAIS/DMM*, *surface*, *subsurface*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
No known or suspected CWM hazard is expected at this site. Therefore, Tables 12 through 19 have been intentionally omitted according to Active Army Guidance.		

Table 20
Determining the CHE Module Rating

	Source	Score	Value	
<p>DIRECTIONS:</p> <ol style="list-style-type: none"> From Tables 11–19, record the data element scores in the Score boxes to the right. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. Add the three Value boxes and record this number in the CHE Module Total box below. Circle the appropriate range for the CHE Module Total below. Circle the CHE Module Rating that corresponds to the range selected and record this value in the CHE Module Rating box found at the bottom of the table. <p>Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.</p>	CWM Hazard Factor Data Elements			
	CWM Configuration	Table 11	0	0
	Sources of CWM	Table 12	--	
	Accessibility Factor Data Elements			
	Location of CWM	Table 13	--	--
	Ease of Access	Table 14	--	
	Status of Property	Table 15	--	
	Receptor Factor Data Elements			
	Population Density	Table 16	--	--
	Population Near Hazard	Table 17	--	
	Types of Activities/Structures	Table 18	--	
	Ecological and/or Cultural Resources	Table 19	--	
	CHE MODULE TOTAL			0
	CHE Module Total		CHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected CWM Hazard		
CHE MODULE RATING		NO KNOWN OR SUSPECTED CWM HAZARD		

Table 21
HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard



Table 22**HHE Module: Surface Water – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard



Table 23**HHE Module: Sediment – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard



Table 24**HHE Module: Surface Water – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard



Table 25**HHE Module: Sediment – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard



Table 26
HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		
<u>Migratory Pathway Factor</u>			
DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.			
Classification	Description	Value	
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H	
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M	
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L	
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).		
<u>Receptor Factor</u>			
DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.			
Classification	Description	Value	
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H	
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M	
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L	
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).		
No Known or Suspected Surface Soil MC Hazard			<input type="checkbox"/>

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

[illegible]

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value		Three-Letter Combination (Hs-Ms-Ls)		Media Rating (A-G)
Groundwater (Table 21)							
Surface Water/Human Endpoint (Table 22)							
Sediment/Human Endpoint (Table 23)							
Surface Water/Ecological Endpoint (Table 24)							
Sediment/Ecological Endpoint (Table 25)							
Surface Soil (Table 26)							

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING**HHE Ratings (for reference only)**

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

Alternative Module Ratings

Evaluation Pending

No Longer Required

No Known or
Suspected MC
Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
<u>B</u>	<u>3</u>	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING				3	

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: JAAP-001-R-02, L2-L3 Extended Buffer Area

Component: Active Army

Installation/Property Name: Joliet Army Ammunition Plant

Location (City, County, State): Wilmington, Will County, Illinois

Point of Contact/Phone No.: Art Holz; 815-423-2870

Site Name/Project Name (Project No.): JAAP-001-R-02

MRSPP Score (Date Scored): 14 August 2009

Preparer's Name (Organization): Catherine Kelly (Malcolm Pirnie)

MRSPP Rating: 3

Date Information Entered/Updated: May 2009; Information contained within this scoring was obtained from sources within the Joliet AAP Administrative Record.

Point of Contact (Name/Phone): JOAAP Commander's Representative Art Holz (815) 423-2870

Project Phase (check only one):

<input type="checkbox"/> PA	<input checked="" type="checkbox"/> SI	<input type="checkbox"/> RI	<input type="checkbox"/> FS	<input type="checkbox"/> RD
<input type="checkbox"/> RA-C	<input type="checkbox"/> RIP	<input type="checkbox"/> RA-O	<input type="checkbox"/> RC	<input type="checkbox"/> LTM

Media Evaluated (check all that apply):

<input type="checkbox"/> Groundwater	<input type="checkbox"/> Sediment (human receptor)
<input type="checkbox"/> Surface soil	<input type="checkbox"/> Surface Water (ecological receptor)
<input type="checkbox"/> Sediment (ecological receptor)	<input type="checkbox"/> Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

Ammunition manufacturing, load, assemble, and packaging occurred between 1941 and 1977. The plant made many types of munitions, including ICM and up to 8-inch Howitzer HE projectiles. At L2, the Explosives Burning Ground 1, open burning and detonation occurred on three gravel pads and a popping furnace. Waste

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

oil was burned in three pits. L3, the Demolition Area, was used for burning, demolition, and a fire training area. This MRS was in the kick-out area for both L2 and L3 (HRR Addendum—Section 2).

Description of Pathways for Human and Ecological Receptors:

Potentially complete pathways exist for all human and ecological receptors (SI Addendum – Section 4.1.4.6).

Description of Receptors (Human and Ecological):

Human access to the site is limited. The only threatened or endangered species potentially inhabiting the L2-L3 Extended Buffer Area are grassland birds including bobolinks, upland sandpipers, and Henslow's sparrows (SI Addendum—Section 4.1.4.4.3).

Table 1
EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	<ul style="list-style-type: none"> ◆ UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). ◆ Hand grenades containing energetic filler. ◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard. 	30
High explosive (used or damaged)	<ul style="list-style-type: none"> ◆ UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ◆ DMM containing a high-explosive filler that have: <ul style="list-style-type: none"> ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability. 	25
Pyrotechnic (used or damaged)	<ul style="list-style-type: none"> ◆ UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). ◆ DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: <ul style="list-style-type: none"> ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability. 	20
High explosive (unused)	<ul style="list-style-type: none"> ◆ DMM containing a high-explosive filler that: <ul style="list-style-type: none"> ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability. 	15
Propellant	<ul style="list-style-type: none"> ◆ UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: <ul style="list-style-type: none"> ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability. 	15
Bulk secondary high explosives, pyrotechnics, or propellant	<ul style="list-style-type: none"> ◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. 	10
Pyrotechnic (not used or damaged)	<ul style="list-style-type: none"> ◆ DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: <ul style="list-style-type: none"> ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability. 	10
Practice	<ul style="list-style-type: none"> ◆ UXO that are practice munitions that are not associated with a sensitive fuze. ◆ DMM that are practice munitions that are not associated with a sensitive fuze and that have not: <ul style="list-style-type: none"> ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability. 	5
Riot control	<ul style="list-style-type: none"> ◆ UXO or DMM containing a riot control agent filler (e.g., tear gas). 	3
Small arms	<ul style="list-style-type: none"> ◆ Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.) 	2
Evidence of no munitions	<ul style="list-style-type: none"> ◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
MUNITIONS TYPE	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	25

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
<p>UXO and DMM located in the MRS are a direct result of operations conducted at the former JOAAP L3 OB/OD Area. The instrument-assisted visual survey conducted during the Site Inspection did not result in any UXO, sub-munitions, 40mm HE, white phosphorus munitions, high-explosive antitank munitions, practice munitions with sensitive fuzes or DMM on the surface; however munitions debris was located. Twenty-five was selected due to a USACE survey conducted in 2007, in which UXO and DMM containing high-explosive fillers that were not considered sensitive were located on the surface (SI Addendum—Section 4.1.4.5.3).</p>		

Table 2
EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with all the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range*, *practice munitions*, *small arms range*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	♦ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	10
Former munitions treatment (i.e., OB/OD) unit	♦ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	♦ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	♦ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	♦ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	♦ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	♦ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	♦ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	♦ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	♦ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	8

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space provided.

Historical records indicate this site is in the kick-out boundary of an area used for demolition of UXO and DMM (HRR Addendum—4.1.1.2).

Table 3**EHE Module: Location of Munitions Data Element Table**

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with all the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed*, *surface*, *subsurface*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	<ul style="list-style-type: none"> Physical evidence indicates that there are UXO or DMM on the surface of the MRS. Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS. 	25
Confirmed subsurface, active	<ul style="list-style-type: none"> Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. 	20
Confirmed subsurface, stable	<ul style="list-style-type: none"> Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. 	15
Suspected (physical evidence)	<ul style="list-style-type: none"> There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS. 	10
Suspected (historical evidence)	<ul style="list-style-type: none"> There is historical evidence indicating that UXO or DMM may be present at the MRS. 	5
Subsurface, physical constraint	<ul style="list-style-type: none"> There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM. 	2
Small arms (regardless of location)	<ul style="list-style-type: none"> The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.) 	1
Evidence of no munitions	<ul style="list-style-type: none"> Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
LOCATION OF MUNITIONS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 25).	25

DIRECTIONS: Document any MRS-specific data used in selecting the **Location of Munitions** classifications in the space provided.

The instrument-assisted visual survey conducted during the Site Inspection did not result in any UXO or DMM on the surface; however munitions debris was located. Twenty-five was selected due to a USACE survey conducted in 2007 in which MEC items were located on the surface (SI Addendum—Section 4.1.4.5.3).

Table 4**EHE Module: Ease of Access Data Element Table**

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	<ul style="list-style-type: none"> There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible). 	10
Barrier to MRS access is incomplete	<ul style="list-style-type: none"> There is a barrier preventing access to parts of the MRS, but not the entire MRS. 	8
Barrier to MRS access is complete but not monitored	<ul style="list-style-type: none"> There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS. 	5
Barrier to MRS access is complete and monitored	<ul style="list-style-type: none"> There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS. 	0
EASE OF ACCESS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Ease of Access** classification in the space provided.

The public has no access to this site; the site is surrounded by a fence with a locked gate, and only two keys exist for the lock. All visitors must be accompanied by facility personnel; however, the area is not monitored to prevent trespassers from gaining access (SI Addendum—Section 4.1.4.1.5).

Table 5**EHE Module: Status of Property Data Element Table**

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	<ul style="list-style-type: none"> ♦ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day. 	5
Scheduled for transfer from DoD control	<ul style="list-style-type: none"> ♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied. 	3
DoD control	<ul style="list-style-type: none"> ♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year. 	0
STATUS OF PROPERTY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Status of Property** classification in the space provided.

The MRS is at a location that has been transferred to the United States Department of Agriculture (SI Addendum—Section 4.1.1).

Table 6**EHE Module: Population Density Data Element Table**

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the highest population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	5
100–500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	3
< 100 persons per square mile	♦ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Density** classification in the space provided.

U.S. Census Bureau 2000 data, Will County = 296-600 persons per square mile. The maximum data class of persons per square mile in the town of Wilmington, which is the closest town to the site is 367.

Table 7**EHE Module: Population Near Hazard Data Element Table**

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the number of inhabited structures.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	♦ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5
16 to 25 inhabited structures	♦ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	♦ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	♦ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	♦ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	♦ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Near Hazard** classification in the space provided.

Homes, offices, a feed mill, and agricultural lands are located within 2 miles of this site. Recent development has increased the number of inhabited structures located up to 2 miles from the boundary of the MRS (HRR Addendum—Section 5.3.2).

Table 8**EHE Module: Types of Activities/Structures Data Element Table**

DIRECTIONS: Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the scores that correspond with all the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5
Parks and recreational areas	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4
Agricultural, forestry	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2
No known or recurring activities	♦ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Types of Activities/Structures** classifications in the space provided.

Homes, offices, a feed mill, and agricultural lands are located within 2 miles of this site. The planned future use for this site is open space for the USDA Midewin National Tallgrass Prairie which is also presently located within 2 miles of the site. Recent development has increased the number of residences located within 2 miles of the MRS (HRR Addendum—Section 5.3.2).

Table 9**EHE Module: Ecological and/or Cultural Resources Data Element Table**

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	♦ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	♦ There are ecological resources present on the MRS.	3
Cultural resources present	♦ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	♦ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the *Ecological and/or Cultural Resources* classification in the space provided.

An ecologist at Midewin National Tallgrass Prairie confirmed that grassland birds are the only threatened and endangered species at JOAAP. These birds include bobolinks, upland sandpipers, and Henslow's sparrows (SI Addendum—Section 4.1.4.4.3). An old cemetery is also located on the site (HRR Addendum—Section 2.1).

Table 10
Determining the EHE Module Rating

	Source	Score	Value	
DIRECTIONS: 1. From Tables 1–9, record the data element scores in the Score boxes to the right. 2. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. 3. Add the three Value boxes and record this number in the EHE Module Total box below. 4. Circle the appropriate range for the EHE Module Total below. 5. Circle the EHE Module Rating that corresponds to the range selected and record this value in the EHE Module Rating box found at the bottom of the table. Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.	Explosive Hazard Factor Data Elements			
	Munitions Type	Table 1	25	33
	Source of Hazard	Table 2	8	
	Accessibility Factor Data Elements			
	Location of Munitions	Table 3	25	35
	Ease of Access	Table 4	5	
	Status of Property	Table 5	5	
	Receptor Factor Data Elements			
	Population Density	Table 6	3	18
	Population Near Hazard	Table 7	5	
	Types of Activities/Structures	Table 8	5	
	Ecological and/or Cultural Resources	Table 9	5	
	EHE MODULE TOTAL			86
	EHE Module Total		EHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected Explosive Hazard		
EHE MODULE RATING		B		

Table 11**CHE Module: CWM Configuration Data Element Table**

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with all the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ CWM that are UXO (i.e., CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. 	30
CWM mixed with UXO	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO. 	25
CWM, explosive configuration that are undamaged DMM	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. 	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container). 	15
CAIS K941 and CAIS K942	<ul style="list-style-type: none"> ♦ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. 	12
CAIS (chemical agent identification sets)	<ul style="list-style-type: none"> ♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. 	10
Evidence of no CWM	<ul style="list-style-type: none"> ♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. 	0
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

DIRECTIONS: Document any MRS-specific data used in selecting the **CWM Configuration** classifications in the space provided.

No CWM was handled at JOAAP (HRR Addendum—Section 4.1.1.2).

Tables 12 - 19

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with all the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *CAIS/DMM*, *surface*, *subsurface*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
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No known or suspected CWM hazard is expected at this site. Therefore, Tables 12 through 19 have been intentionally omitted according to Active Army Guidance.

Table 20
Determining the CHE Module Rating

	Source	Score	Value	
DIRECTIONS: <ol style="list-style-type: none"> From Tables 11–19, record the data element scores in the Score boxes to the right. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. Add the three Value boxes and record this number in the CHE Module Total box below. Circle the appropriate range for the CHE Module Total below. Circle the CHE Module Rating that corresponds to the range selected and record this value in the CHE Module Rating box found at the bottom of the table. <p>Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.</p>	CWM Hazard Factor Data Elements			
	CWM Configuration	Table 11	0	0
	Sources of CWM	Table 12	--	
	Accessibility Factor Data Elements			
	Location of CWM	Table 13	--	--
	Ease of Access	Table 14	--	
	Status of Property	Table 15	--	
	Receptor Factor Data Elements			
	Population Density	Table 16	--	--
	Population Near Hazard	Table 17	--	
	Types of Activities/Structures	Table 18	--	
	Ecological and/or Cultural Resources	Table 19	--	
	CHE MODULE TOTAL			0
	CHE Module Total		CHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings	Evaluation Pending			
	No Longer Required			
	No Known or Suspected CWM Hazard			
CHE MODULE RATING		NO KNOWN OR SUSPECTED CWM HAZARD		

Tables 21 – 27

No environmental media (groundwater, surface water, sediment, or surface soil) samples were collected or analyzed under this SI Addendum effort, as agreed upon by stakeholders and regulators during Technical Project Planning Meeting 2. As a result the HHE Module has not been evaluated. Tables 21 – 27 have therefore been intentionally omitted per active-Army guidance, and the HHE score will remain “Evaluation Pending” until analytical data becomes available.

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value		Three-Letter Combination (Hs-Ms-Ls)		Media Rating (A-G)
Groundwater (Table 21)							
Surface Water/Human Endpoint (Table 22)							
Sediment/Human Endpoint (Table 23)							
Surface Water/Ecological Endpoint (Table 24)							
Sediment/Ecological Endpoint (Table 25)							
Surface Soil (Table 26)							

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING**HHE Ratings (for reference only)**

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

Alternative Module Ratings

Evaluation Pending

No Longer Required

No Known or Suspected MC Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING				3	

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: Explosive Burning Ground 1 (L2)

Component: Active Army

Installation/Property Name: Joliet Army Ammunition Plant

Location (City, County, State): Wilmington, Will County, Illinois

Point of Contact/Phone No.: Art Holz; 815-423-2870

Site Name/Project Name (Project No.): JAAP-002-R-01

MRSP Score (Date Scored): 14 August 2009

Preparer's Name (Organization): Andrew Maly (USAEC)

MRSP Rating: 3

Date Information Entered/Updated: 14 August 2009; Information contained within this scoring was obtained from sources within the Joliet AAP Administrative Record.

Point of Contact (Name/Phone): Andrew Maly, 410.436.1611

Project Phase (check only one):

<input type="checkbox"/> PA	<input type="checkbox"/> SI	<input type="checkbox"/> RI	<input type="checkbox"/> FS	<input type="checkbox"/> RD
<input type="checkbox"/> RA-C	<input type="checkbox"/> RIP	<input type="checkbox"/> RA-O	<input type="checkbox"/> RC	<input checked="" type="checkbox"/> LTM

Media Evaluated (check all that apply):

<input checked="" type="checkbox"/> Groundwater	<input type="checkbox"/> Sediment (human receptor)
<input checked="" type="checkbox"/> Surface soil	<input type="checkbox"/> Surface Water (ecological receptor)
<input type="checkbox"/> Sediment (ecological receptor)	<input type="checkbox"/> Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

Ammunition manufacturing, load, assemble, and packaging occurred between 1941 and 1977. The plant made many types of munitions, including ICM and up to 8-inch Howitzer HE projectiles. This MRS is a boundary around a former burning area which included popping furnaces used to burn waste and excess explosives. A remedial action consisting of clearance to 1' depth was conducted in 2007 (HRR Addendum, 2008—Section 2).

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Description of Pathways for Human and Ecological Receptors:

Soil is considered to be a complete pathway for Human and Ecological Receptors; however, soil contamination levels were revised to reflect results of sampling from within the MRS, and not from the adjacent IRP site.

Description of Receptors (Human and Ecological):

Human access to the site is limited. The only threatened or endangered species potentially inhabiting JOAAP are grassland birds, including bobolinks, upland sandpipers, and Henslow's sparrows (SI Addendum, 2009—Section 4.1.4.4.3).

Table 1**EHE Module: Munitions Type Data Element Table**

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	<ul style="list-style-type: none"> UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). Hand grenades containing energetic filler. Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard. 	30
High explosive (used or damaged)	<ul style="list-style-type: none"> UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." DMM containing a high-explosive filler that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	25
Pyrotechnic (used or damaged)	<ul style="list-style-type: none"> UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	20
High explosive (unused)	<ul style="list-style-type: none"> DMM containing a high-explosive filler that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	15
Propellant	<ul style="list-style-type: none"> UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: <ul style="list-style-type: none"> Damaged by burning or detonation Deteriorated to the point of instability. 	15
Bulk secondary high explosives, pyrotechnics, or propellant	<ul style="list-style-type: none"> DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. 	10
Pyrotechnic (not used or damaged)	<ul style="list-style-type: none"> DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	10
Practice	<ul style="list-style-type: none"> UXO that are practice munitions that are not associated with a sensitive fuze. DMM that are practice munitions that are not associated with a sensitive fuze and that have not: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	5
Riot control	<ul style="list-style-type: none"> UXO or DMM containing a riot control agent filler (e.g., tear gas). 	3
Small arms	<ul style="list-style-type: none"> Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.) 	2
Evidence of no munitions	<ul style="list-style-type: none"> Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
MUNITIONS TYPE	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	30

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
<p>DIRECTIONS: Document any MRS-specific data used in selecting the <i>Munitions Type</i> classifications in the space provided.</p> <p>The site is a 200-foot buffer zone surrounding the IRP site JAAP-0L2. The Explosive Burning Ground was used from approximately 1942 through the 1970s to burn explosives and associated waste. The IRP site consisted of approximately 45 acres which included six 650 foot long by 50 foot wide gravel burning pads, three popping furnaces, and three oil disposal pits.</p> <p>Work to clear the site to 1' depth was put under contract in 2005, and work began and was completed in 2007. The site-specific final report for this site (currently draft) indicates the type and quantity of MEC items recovered. The most significant items were BLU 26 and BLU 32, which are the basis for increasing the score for this Table (Draft Final Site-Specific Final Report MMRP Site L2, 2008).</p>		

Table 2
EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with all the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range*, *practice munitions*, *small arms range*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	♦ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	10
Former munitions treatment (i.e., OB/OD) unit	♦ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	♦ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	♦ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	♦ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	♦ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	♦ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	♦ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	♦ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	♦ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	8

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space provided.

Historical records indicate this site is in the kick-out boundary of an area used for demolition of UXO and DMM (SI, 2005—Section 4.1).

Table 3**EHE Module: Location of Munitions Data Element Table**

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with all the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed*, *surface*, *subsurface*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	<ul style="list-style-type: none"> Physical evidence indicates that there are UXO or DMM on the surface of the MRS. Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS. 	25
Confirmed subsurface, active	<ul style="list-style-type: none"> Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. 	20
Confirmed subsurface, stable	<ul style="list-style-type: none"> Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. 	15
Suspected (physical evidence)	<ul style="list-style-type: none"> There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS. 	10
Suspected (historical evidence)	<ul style="list-style-type: none"> There is historical evidence indicating that UXO or DMM may be present at the MRS. 	5
Subsurface, physical constraint	<ul style="list-style-type: none"> There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM. 	2
Small arms (regardless of location)	<ul style="list-style-type: none"> The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.) 	1
Evidence of no munitions	<ul style="list-style-type: none"> Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
LOCATION OF MUNITIONS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 25).	20

DIRECTIONS: Document any MRS-specific data used in selecting the **Location of Munitions** classifications in the space provided.

In 2007, MKM and PIKA International performed a 1' surface clearance of the site. During the clearance operations, the site was subject to flooding, and this resulted in the exposure of previously buried items (which were also cleared). The site will be subject to regular flooding due to its proximity to Prairie Creek. The clearance is documented in the site specific report (Draft Final Site-Specific Final Report MMRP Site L2, 2008).

Table 4**EHE Module: Ease of Access Data Element Table**

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	♦ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	♦ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8
Barrier to MRS access is complete but not monitored	♦ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	♦ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0
EASE OF ACCESS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Ease of Access** classification in the space provided.

The public has no access to this site; the site is surrounded by a fence with a locked gate, and only two keys exist for the lock. All visitors must be accompanied by facility personnel; however, the area is not monitored to prevent trespassers from gaining access (HRR Addendum, 2008—Section 5.3.2).

Table 5**EHE Module: Status of Property Data Element Table**

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	<ul style="list-style-type: none"> ♦ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day. 	5
Scheduled for transfer from DoD control	<ul style="list-style-type: none"> ♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied. 	3
DoD control	<ul style="list-style-type: none"> ♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year. 	0
STATUS OF PROPERTY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the **Status of Property** classification in the space provided.

The planned future use for this site is open space for the USDA Midewin National Tallgrass Prairie (HRR Addendum, 2008—Section 5.3.2).

Table 6**EHE Module: Population Density Data Element Table**

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the highest population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	5
100–500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	3
< 100 persons per square mile	♦ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Density** classification in the space provided.

U.S. Census Bureau 2000 data, Will County = 296 – 600 persons per square mile. The maximum data class of persons per square mile in the town of Wilmington, which is the closest town to the site is 367.

Table 7**EHE Module: Population Near Hazard Data Element Table**

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the number of inhabited structures.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	♦ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5
16 to 25 inhabited structures	♦ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	♦ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	♦ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	♦ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	♦ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Near Hazard** classification in the space provided.

Homes, offices, a feed mill, and agricultural lands are located within 2 miles of this site. Recent development has increased the number of inhabited structures located up to 2 miles from the boundary of the MRS (HRR Addendum, 2008—Section 5.3.2).

Table 8**EHE Module: Types of Activities/Structures Data Element Table**

DIRECTIONS: Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the scores that correspond with all the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5
Parks and recreational areas	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4
Agricultural, forestry	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2
No known or recurring activities	♦ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Types of Activities/Structures** classifications in the space provided.

Homes, offices, a feed mill, and agricultural lands are located within 2 miles of this site. The planned future use for this site is open space for the USDA Midewin National Tallgrass Prairie which is also presently located within 2 miles of the site. Recent development has increased the number of residences located within 2 miles of the MRS (HRR Addendum, 2008—Section 5.3.2).

Table 9**EHE Module: Ecological and/or Cultural Resources Data Element Table**

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	♦ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	♦ There are ecological resources present on the MRS.	3
Cultural resources present	♦ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	♦ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the *Ecological and/or Cultural Resources* classification in the space provided.

This site is adjacent to Prairie Creek and Kemery Lake. An ecologist at Midewin Tallgrass Prairie confirmed that grassland birds are the only threatened and endangered species at JOAAP. These birds include bobolinks, upland sandpipers, and Henslow's sparrows (HRR Addendum, 2008—Section 5.3.3.2)

Table 10
Determining the EHE Module Rating

	Source	Score	Value	
<p>DIRECTIONS:</p> <ol style="list-style-type: none"> From Tables 1–9, record the data element scores in the Score boxes to the right. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. Add the three Value boxes and record this number in the EHE Module Total box below. Circle the appropriate range for the EHE Module Total below. Circle the EHE Module Rating that corresponds to the range selected and record this value in the EHE Module Rating box found at the bottom of the table. <p>Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.</p>	Explosive Hazard Factor Data Elements			
	Munitions Type	Table 1	30	38
	Source of Hazard	Table 2	8	
	Accessibility Factor Data Elements			
	Location of Munitions	Table 3	20	28
	Ease of Access	Table 4	5	
	Status of Property	Table 5	3	
	Receptor Factor Data Elements			
	Population Density	Table 6	3	16
	Population Near Hazard	Table 7	5	
	Types of Activities/Structures	Table 8	5	
	Ecological and/or Cultural Resources	Table 9	3	
	EHE MODULE TOTAL			82
	EHE Module Total		EHE Module Rating	
	92 to 100		A	
	82 to 91		(B)	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected Explosive Hazard		
EHE MODULE RATING		B		

Table 11**CHE Module: CWM Configuration Data Element Table**

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with all the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> • CWM that are UXO (i.e., CWM/UXO) • Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. 	30
CWM mixed with UXO	<ul style="list-style-type: none"> • The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO. 	25
CWM, explosive configuration that are undamaged DMM	<ul style="list-style-type: none"> • The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. 	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> • Nonexplosively configured CWM/DMM either damaged or undamaged • Bulk CWM (e.g., ton container). 	15
CAIS K941 and CAIS K942	<ul style="list-style-type: none"> • The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. 	12
CAIS (chemical agent identification sets)	<ul style="list-style-type: none"> • CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. 	10
Evidence of no CWM	<ul style="list-style-type: none"> • Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. 	0
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

DIRECTIONS: Document any MRS-specific data used in selecting the **CWM Configuration** classifications in the space provided.

The historical use of the site did not include CWM (HRR Addendum, 2008—Section 4.1.1.2). EODT performed a site characterization for this area in 2001 and no CWM was found. Site clearance to 1' depth conducted in 2007 did not find any CWM (Draft Final Site-Specific Final Report MMRP Site L2, 2008).

Tables 12 - 19

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with all the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *CAIS/DMM*, *surface*, *subsurface*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
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No known or suspected CWM hazard is expected at this site. Therefore, Tables 12 through 19 have been intentionally omitted according to Active Army Guidance.

Table 20
Determining the CHE Module Rating

	Source	Score	Value	
<p>DIRECTIONS:</p> <ol style="list-style-type: none"> From Tables 11–19, record the data element scores in the Score boxes to the right. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. Add the three Value boxes and record this number in the CHE Module Total box below. Circle the appropriate range for the CHE Module Total below. Circle the CHE Module Rating that corresponds to the range selected and record this value in the CHE Module Rating box found at the bottom of the table. <p>Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.</p>	CWM Hazard Factor Data Elements			
	CWM Configuration	Table 11	0	0
	Sources of CWM	Table 12	--	
	Accessibility Factor Data Elements			
	Location of CWM	Table 13	--	--
	Ease of Access	Table 14	--	
	Status of Property	Table 15	--	
	Receptor Factor Data Elements			
	Population Density	Table 16	--	--
	Population Near Hazard	Table 17	--	
	Types of Activities/Structures	Table 18	--	
	Ecological and/or Cultural Resources	Table 19	--	
	CHE MODULE TOTAL			0
	CHE Module Total		CHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
	48 to 59		E	
	38 to 47		F	
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected CWM Hazard		
CHE MODULE RATING		NO KNOWN OR SUSPECTED CWM HAZARD		

Table 21
HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard



Table 22**HHE Module: Surface Water – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard



Table 23**HHE Module: Sediment – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard



Table 24**HHE Module: Surface Water – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard



Table 25**HHE Module: Sediment – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard



Table 26
HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Soil MC Hazard ☒

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

[illegible]

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value		Three-Letter Combination (Hs-Ms-Ls)		Media Rating (A-G)
Groundwater (Table 21)							
Surface Water/Human Endpoint (Table 22)							
Sediment/Human Endpoint (Table 23)							
Surface Water/Ecological Endpoint (Table 24)							
Sediment/Ecological Endpoint (Table 25)							
Surface Soil (Table 26)							

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING**HHE Ratings (for reference only)**

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

Alternative Module Ratings

Evaluation Pending

No Longer Required

No Known or
Suspected MC
Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
<u>B</u>	<u>3</u>	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING				3	

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: Training Area 7

Component: Active Army

Installation/Property Name: Joliet Army Ammunition Plant

Location (City, County, State): Wilmington, Will County, Illinois

Point of Contact/Phone No.: Art Holz; 815-423-2870

Site Name/Project Name (Project No.): JAAP-003-R-01

MRSP Score (Date Scored): 14 August 2009

Preparer's Name (Organization): Andrew Maly (USAEC)

MRSP Rating: No known or suspected hazard

Date Information Entered/Updated: 14 August 2009; Information contained within this scoring was obtained from sources within the Joliet AAP Administrative Record.

Point of Contact (Name/Phone): Andrew Maly, 410.436.1611

Project Phase (check only one):

<input type="checkbox"/> PA	<input type="checkbox"/> SI	<input type="checkbox"/> RI	<input type="checkbox"/> FS	<input type="checkbox"/> RD
<input type="checkbox"/> RA-C	<input type="checkbox"/> RIP	<input type="checkbox"/> RA-O	<input checked="" type="checkbox"/> RC	<input type="checkbox"/> LTM

Media Evaluated (check all that apply):

<input checked="" type="checkbox"/> Groundwater	<input type="checkbox"/> Sediment (human receptor)
<input checked="" type="checkbox"/> Surface soil	<input type="checkbox"/> Surface Water (ecological receptor)
<input type="checkbox"/> Sediment (ecological receptor)	<input type="checkbox"/> Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type: Ammunition manufacturing, load, assemble, and packaging occurred between 1941 and 1977. The plant made many types of munitions, including ICM and up to 8-inch Howitzer HE projectiles. This MRS was a maneuver training area where pyrotechnics and blank, small-caliber rounds may have been used (HRR Addendum, 2008—Section 2).

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Description of Pathways for Human and Ecological Receptors:
None at this site.

Description of Receptors (Human and Ecological):
None at this site.

Table 1**EHE Module: Munitions Type Data Element Table**

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	<ul style="list-style-type: none"> UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). Hand grenades containing energetic filler. Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard. 	30
High explosive (used or damaged)	<ul style="list-style-type: none"> UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." DMM containing a high-explosive filler that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	25
Pyrotechnic (used or damaged)	<ul style="list-style-type: none"> UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	20
High explosive (unused)	<ul style="list-style-type: none"> DMM containing a high-explosive filler that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	15
Propellant	<ul style="list-style-type: none"> UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: <ul style="list-style-type: none"> Damaged by burning or detonation Deteriorated to the point of instability. 	15
Bulk secondary high explosives, pyrotechnics, or propellant	<ul style="list-style-type: none"> DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. 	10
Pyrotechnic (not used or damaged)	<ul style="list-style-type: none"> DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	10
Practice	<ul style="list-style-type: none"> UXO that are practice munitions that are not associated with a sensitive fuze. DMM that are practice munitions that are not associated with a sensitive fuze and that have not: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	5
Riot control	<ul style="list-style-type: none"> UXO or DMM containing a riot control agent filler (e.g., tear gas). 	3
Small arms	<ul style="list-style-type: none"> Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.) 	2
Evidence of no munitions	<ul style="list-style-type: none"> Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
MUNITIONS TYPE	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
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DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

The SI field work for this site was conducted in November 2004. No MEC was found and no MC were detected above the RGs from the June 2004 ROD. Training Area 7 is not considered to have any sources for exposure pathways. A teleconference held in March 2005 to discuss findings of the field work and the Army, EPA, and IEPA concluded that based on the goals of the SI and the findings of the site walk, no further investigation was necessary for this site (SI Report, 2005—Section 4.3).

Tables 2—9

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with all the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range*, *practice munitions*, *small arms range*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space provided.

It was determined that no further investigation was necessary for this site. Therefore, Tables 2 through 9 have been intentionally omitted according to Active Army guidance.

Table 10
Determining the EHE Module Rating

	Source	Score	Value	
<p>DIRECTIONS:</p> <ol style="list-style-type: none"> From Tables 1–9, record the data element scores in the Score boxes to the right. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. Add the three Value boxes and record this number in the EHE Module Total box below. Circle the appropriate range for the EHE Module Total below. Circle the EHE Module Rating that corresponds to the range selected and record this value in the EHE Module Rating box found at the bottom of the table. <p>Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.</p>	Explosive Hazard Factor Data Elements			
	Munitions Type	Table 1	0	0
	Source of Hazard	Table 2		
	Accessibility Factor Data Elements			
	Location of Munitions	Table 3		
	Ease of Access	Table 4		
	Status of Property	Table 5		
	Receptor Factor Data Elements			
	Population Density	Table 6		
	Population Near Hazard	Table 7		
	Types of Activities/Structures	Table 8		
	Ecological and/or Cultural Resources	Table 9		
	EHE MODULE TOTAL			
	EHE Module Total		EHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected Explosive Hazard		
EHE MODULE RATING		NO KNOWN OR SUSPECTED EXPLOSIVE HAZARD		

Table 11**CHE Module: CWM Configuration Data Element Table**

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with all the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ CWM that are UXO (i.e., CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. 	30
CWM mixed with UXO	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO. 	25
CWM, explosive configuration that are undamaged DMM	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. 	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container). 	15
CAIS K941 and CAIS K942	<ul style="list-style-type: none"> ♦ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. 	12
CAIS (chemical agent identification sets)	<ul style="list-style-type: none"> ♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. 	10
Evidence of no CWM	<ul style="list-style-type: none"> ♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. 	0
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

DIRECTIONS: Document any MRS-specific data used in selecting the **CWM Configuration** classifications in the space provided.

The historical use of the site did not include CWM (HRR, 2005—Section 4.5.3). In addition, a visual survey of 10% of the site was completed from 15-18 November 2004 and no evidence of CWM was found (SI Report, 2005—Section 4.3).

Tables 12 - 19

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with all the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *CAIS/DMM*, *surface*, *subsurface*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
No known or suspected CWM hazard is expected at this site. Therefore, Tables 12 through 19 have been intentionally omitted according to Active Army Guidance.		

Table 20
Determining the CHE Module Rating

	Source	Score	Value	
<p>DIRECTIONS:</p> <ol style="list-style-type: none"> From Tables 11–19, record the data element scores in the Score boxes to the right. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. Add the three Value boxes and record this number in the CHE Module Total box below. Circle the appropriate range for the CHE Module Total below. Circle the CHE Module Rating that corresponds to the range selected and record this value in the CHE Module Rating box found at the bottom of the table. <p>Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.</p>	CWM Hazard Factor Data Elements			
	CWM Configuration	Table 11	0	0
	Sources of CWM	Table 12	--	
	Accessibility Factor Data Elements			
	Location of CWM	Table 13	--	--
	Ease of Access	Table 14	--	
	Status of Property	Table 15	--	
	Receptor Factor Data Elements			
	Population Density	Table 16	--	--
	Population Near Hazard	Table 17	--	
	Types of Activities/Structures	Table 18	--	
	Ecological and/or Cultural Resources	Table 19	--	
	CHE MODULE TOTAL			0
	CHE Module Total		CHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected CWM Hazard		
CHE MODULE RATING		NO KNOWN OR SUSPECTED CWM HAZARD		

Table 21
HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard



Table 22**HHE Module: Surface Water – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard



Table 23**HHE Module: Sediment – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard



Table 24**HHE Module: Surface Water – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard



Table 25**HHE Module: Sediment – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard



Table 26
HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Soil MC Hazard ☒

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

[illegible]

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value		Three-Letter Combination (Hs-Ms-Ls)		Media Rating (A-G)
Groundwater (Table 21)							
Surface Water/Human Endpoint (Table 22)							
Sediment/Human Endpoint (Table 23)							
Surface Water/Ecological Endpoint (Table 24)							
Sediment/Ecological Endpoint (Table 25)							
Surface Soil (Table 26)							

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING**HHE Ratings (for reference only)**

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

Alternative Module Ratings

Evaluation Pending

No Longer Required

No Known or
Suspected MC
Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING				NO KNOWN OR SUSPECTED HAZARD	

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: Former Burning Area (L34)

Component: Active Army

Installation/Property Name: Joliet Army Ammunition Plant

Location (City, County, State): Wilmington, Will County, Illinois

Point of Contact/Phone No.: Art Holz; 815-423-2870

Site Name/Project Name (Project No.): JAAP-004-R-01

MRSP Score (Date Scored): 14 August 2009

Preparer's Name (Organization): Andrew Maly (USAEC)

MRSP Rating: No known or suspected hazard

Date Information Entered/Updated: 14 August 2009; Information contained within this scoring was obtained from sources within the Joliet AAP Administrative Record.

Point of Contact (Name/Phone): Andrew Maly, 410.436.1611

Project Phase (check only one):

<input type="checkbox"/> PA	<input type="checkbox"/> SI	<input type="checkbox"/> RI	<input type="checkbox"/> FS	<input type="checkbox"/> RD
<input type="checkbox"/> RA-C	<input type="checkbox"/> RIP	<input type="checkbox"/> RA-O	<input type="checkbox"/> RC	<input checked="" type="checkbox"/> LTM

Media Evaluated (check all that apply):

<input checked="" type="checkbox"/> Groundwater	<input type="checkbox"/> Sediment (human receptor)
<input checked="" type="checkbox"/> Surface soil	<input type="checkbox"/> Surface Water (ecological receptor)
<input type="checkbox"/> Sediment (ecological receptor)	<input type="checkbox"/> Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

Ammunition manufacturing, load, assemble, and packaging occurred between 1941 and 1977. The plant made many types of munitions, including ICM and up to 8-inch Howitzer HE projectiles. The remedial action completed in 2007 found no evidence of MEC (HRR Addendum, 2008—Section 2).

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Description of Pathways for Human and Ecological Receptors:

Soil is considered to be a complete pathway for Human and Ecological Receptors. Current soil data has been input into this site evaluation.

Description of Receptors (Human and Ecological):

Human access to the site is limited. The only threatened or endangered species potentially inhabiting JOAAP are grassland birds including bobolinks, upland sandpipers, and Henslow's sparrows (SI Addendum, 2009—Section 4.1.4.4.3).

Table 1**EHE Module: Munitions Type Data Element Table**

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	<ul style="list-style-type: none"> UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). Hand grenades containing energetic filler. Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard. 	30
High explosive (used or damaged)	<ul style="list-style-type: none"> UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." DMM containing a high-explosive filler that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	25
Pyrotechnic (used or damaged)	<ul style="list-style-type: none"> UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	20
High explosive (unused)	<ul style="list-style-type: none"> DMM containing a high-explosive filler that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	15
Propellant	<ul style="list-style-type: none"> UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: <ul style="list-style-type: none"> Damaged by burning or detonation Deteriorated to the point of instability. 	15
Bulk secondary high explosives, pyrotechnics, or propellant	<ul style="list-style-type: none"> DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. 	10
Pyrotechnic (not used or damaged)	<ul style="list-style-type: none"> DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: <ul style="list-style-type: none"> Have not been damaged by burning or detonation Are not deteriorated to the point of instability. 	10
Practice	<ul style="list-style-type: none"> UXO that are practice munitions that are not associated with a sensitive fuze. DMM that are practice munitions that are not associated with a sensitive fuze and that have not: <ul style="list-style-type: none"> Been damaged by burning or detonation Deteriorated to the point of instability. 	5
Riot control	<ul style="list-style-type: none"> UXO or DMM containing a riot control agent filler (e.g., tear gas). 	3
Small arms	<ul style="list-style-type: none"> Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.) 	2
Evidence of no munitions	<ul style="list-style-type: none"> Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
MUNITIONS TYPE	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
<p>DIRECTIONS: Document any MRS-specific data used in selecting the <i>Munitions Type</i> classifications in the space provided.</p> <p>The site was used for open burning of propellant and explosive waste. EODT performed a removal action for this area in 2001. The Ordnance Removal and Characterization Report indicates that 15 MEC scrap items consisting of ceramic and glass M5 mines and nose and base fuzes were found (one of which contained explosives); however, less than 10% of the site was cleared and UXO were considered likely to be present (SI Report, 2005—Section 4.4).</p> <p>A removal action was conducted in 2007 by PIKA International and MKM. 3.5 acres of the site were cleared to 1' depth. No individual MEC items were discovered at the MRS during the RA (Draft Final Site-Specific Final Report MMRP Site L34, 2008).</p>		

Table 2—9

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with all the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range*, *practice munitions*, *small arms range*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space provided.

No MEC items were discovered at the MRS during the RA (Draft Final Site-Specific Final Report MMRP Site L34, 2008). Therefore, Tables 2 through 9 have been intentionally omitted according to Active Army guidance.

Table 10
Determining the EHE Module Rating

	Source	Score	Value	
DIRECTIONS: 1. From Tables 1–9, record the data element scores in the Score boxes to the right. 2. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. 3. Add the three Value boxes and record this number in the EHE Module Total box below. 4. Circle the appropriate range for the EHE Module Total below. 5. Circle the EHE Module Rating that corresponds to the range selected and record this value in the EHE Module Rating box found at the bottom of the table. Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.	Explosive Hazard Factor Data Elements			
	Munitions Type	Table 1	0	
	Source of Hazard	Table 2		
	Accessibility Factor Data Elements			
	Location of Munitions	Table 3		
	Ease of Access	Table 4		
	Status of Property	Table 5		
	Receptor Factor Data Elements			
	Population Density	Table 6		
	Population Near Hazard	Table 7		
	Types of Activities/Structures	Table 8		
	Ecological and/or Cultural Resources	Table 9		
	EHE MODULE TOTAL			
	EHE Module Total		EHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected Explosive Hazard		
EHE MODULE RATING		NO KNOWN OR SUSPECTED EXPLOSIVE HAZARD		

Table 11**CHE Module: CWM Configuration Data Element Table**

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with all the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ CWM that are UXO (i.e., CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. 	30
CWM mixed with UXO	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO. 	25
CWM, explosive configuration that are undamaged DMM	<ul style="list-style-type: none"> ♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. 	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: <ul style="list-style-type: none"> ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container). 	15
CAIS K941 and CAIS K942	<ul style="list-style-type: none"> ♦ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. 	12
CAIS (chemical agent identification sets)	<ul style="list-style-type: none"> ♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. 	10
Evidence of no CWM	<ul style="list-style-type: none"> ♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. 	0
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

DIRECTIONS: Document any MRS-specific data used in selecting the **CWM Configuration** classifications in the space provided.

The historical use of the site did not include CWM (HRR, 2005—Section 4.4.3). In 1981, Donahue and Associates collected samples on the site, and sampling again took place at the site in 1993 by Dames and Moore. EODT performed a removal action for this area in 2001. No CWM was found during these site investigations. Site clearance to 1' depth conducted in 2007 did not find any CWM (Draft Final Site-Specific Report MMRP Site L34, 2008).

Tables 12 - 19

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with all the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *CAIS/DMM*, *surface*, *subsurface*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
----------------	-------------	-------

No known or suspected CWM hazard is expected at this site. Therefore, Tables 12 through 19 have been intentionally omitted according to Active Army Guidance.

Table 20
Determining the CHE Module Rating

	Source	Score	Value	
<p>DIRECTIONS:</p> <ol style="list-style-type: none"> From Tables 11–19, record the data element scores in the Score boxes to the right. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. Add the three Value boxes and record this number in the CHE Module Total box below. Circle the appropriate range for the CHE Module Total below. Circle the CHE Module Rating that corresponds to the range selected and record this value in the CHE Module Rating box found at the bottom of the table. <p>Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.</p>	CWM Hazard Factor Data Elements			
	CWM Configuration	Table 11	0	0
	Sources of CWM	Table 12	--	
	Accessibility Factor Data Elements			
	Location of CWM	Table 13	--	--
	Ease of Access	Table 14	--	
	Status of Property	Table 15	--	
	Receptor Factor Data Elements			
	Population Density	Table 16	--	--
	Population Near Hazard	Table 17	--	
	Types of Activities/Structures	Table 18	--	
	Ecological and/or Cultural Resources	Table 19	--	
	CHE MODULE TOTAL			0
	CHE Module Total		CHE Module Rating	
	92 to 100		A	
	82 to 91		B	
	71 to 81		C	
	60 to 70		D	
48 to 59		E		
38 to 47		F		
less than 38		G		
Alternative Module Ratings		Evaluation Pending		
		No Longer Required		
		No Known or Suspected CWM Hazard		
CHE MODULE RATING		NO KNOWN OR SUSPECTED CWM HAZARD		

Table 21
HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard



Table 22**HHE Module: Surface Water – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard



Table 23**HHE Module: Sediment – Human Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard



Table 24**HHE Module: Surface Water – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard



Table 25**HHE Module: Sediment – Ecological Endpoint Data Element Table****Contaminant Hazard Factor (CHF)**

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard



Table 26
HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Soil MC Hazard ☒

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

[illegible]

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value		Three-Letter Combination (Hs-Ms-Ls)		Media Rating (A-G)
Groundwater (Table 21)							
Surface Water/Human Endpoint (Table 22)							
Sediment/Human Endpoint (Table 23)							
Surface Water/Ecological Endpoint (Table 24)							
Sediment/Ecological Endpoint (Table 25)							
Surface Soil (Table 26)							

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING**HHE Ratings (for reference only)**

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

Alternative Module Ratings

Evaluation Pending

No Longer Required

No Known or
Suspected MC
Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard				No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING					
				NO KNOWN OR SUSPECTED HAZARD	